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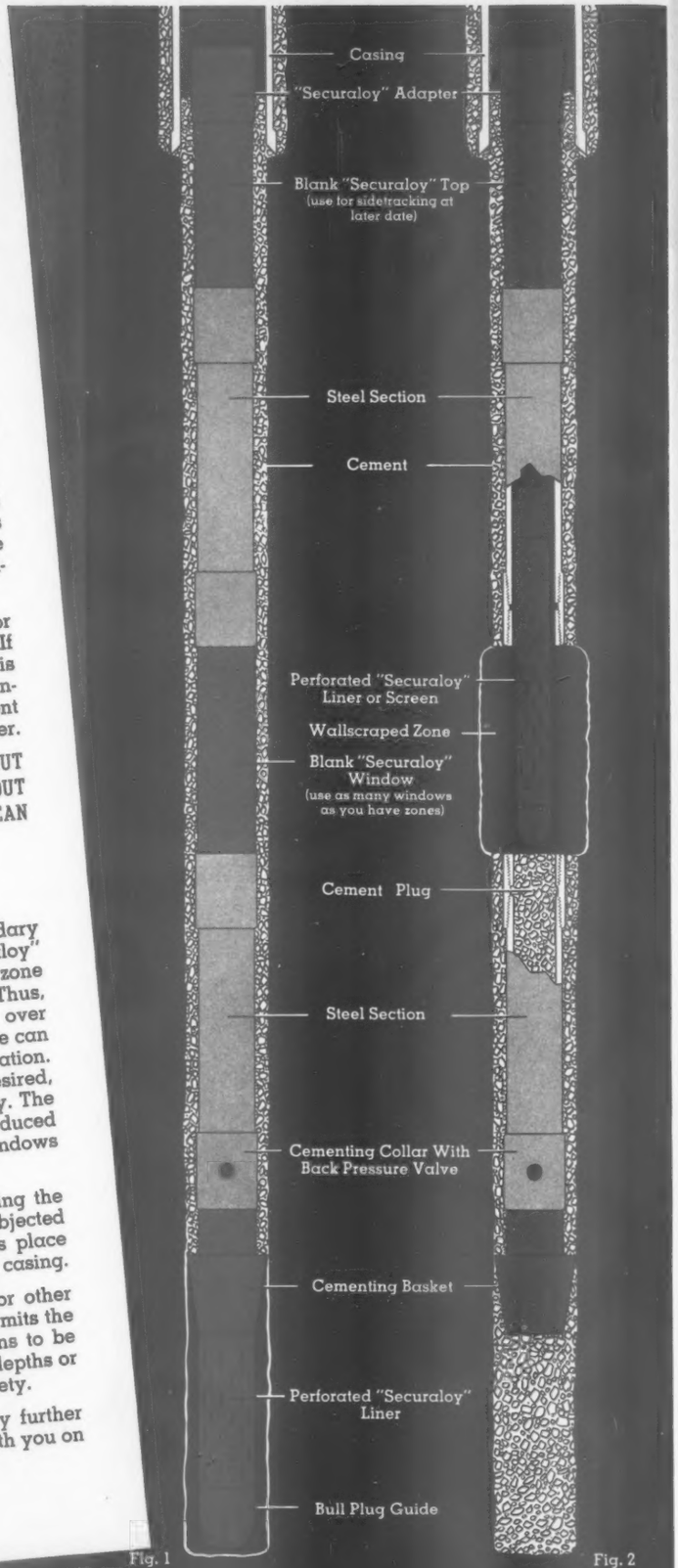

Fig. 1 Fig. 2

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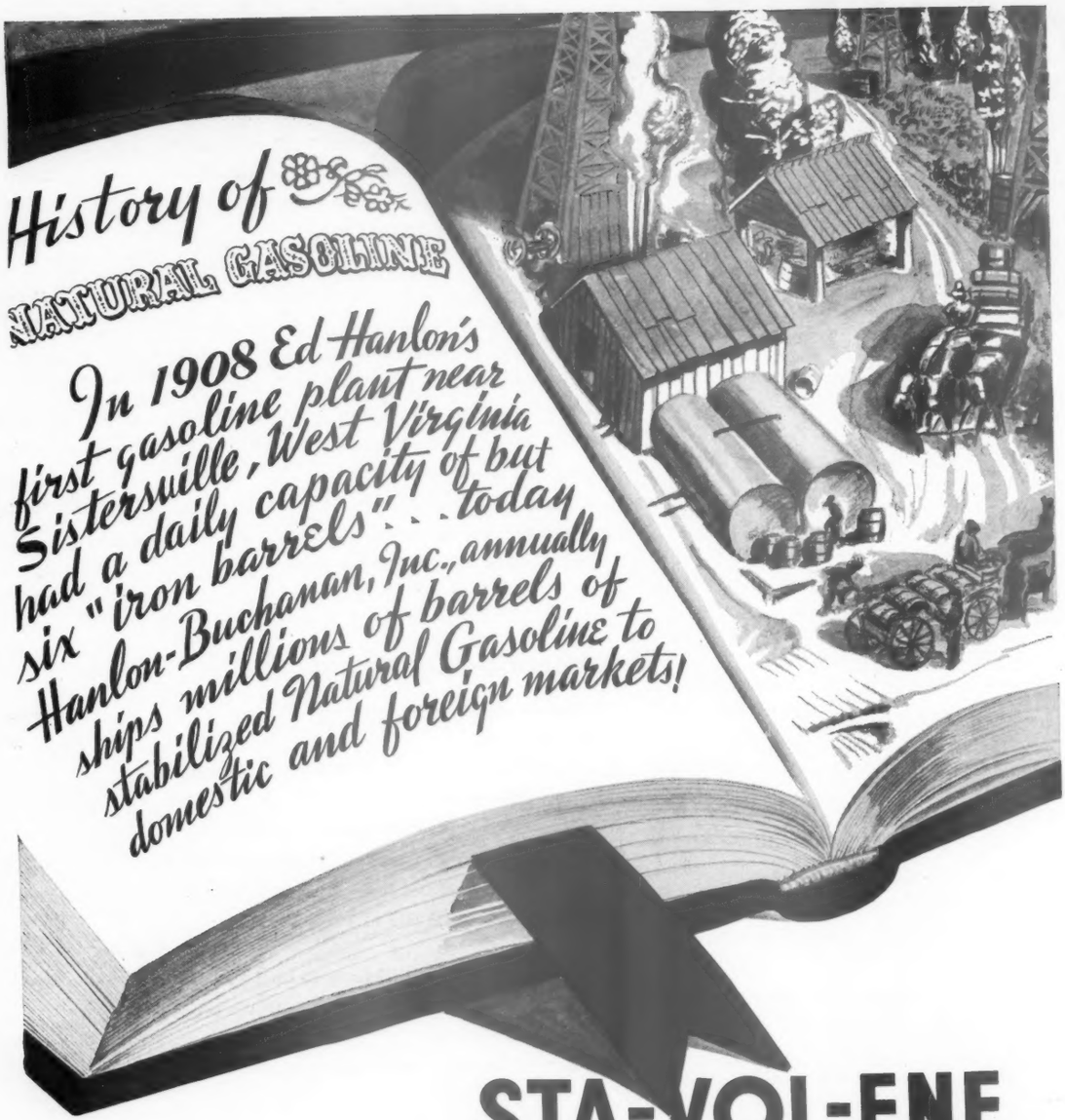
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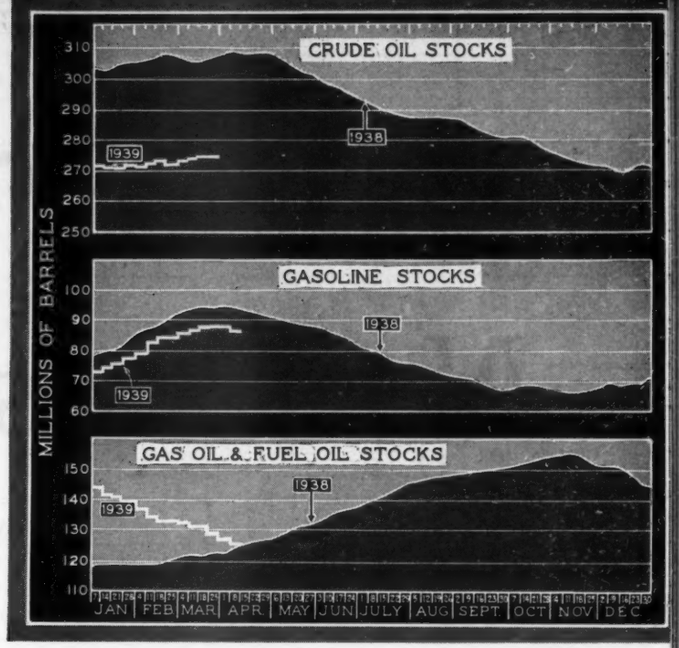
Trends

Stock Data Reveal Excess Production at Several Points



AN increase of more than two million barrels in crude oil stocks for the week ending April 1 has served to focus the attention of the industry on the fact that while there has been improvement in the position of refinery products, the trend in crude inventories has been upward in recent weeks. This is in contrast to last year when stocks of several refinery products increased while crude inventories were lowered.

CRUDE PRODUCTION *3,445,197 barrels daily average — up 83,340. One year ago 3,392,638 barrels.*

CRUDE STOCKS *276,119,000 barrels as of April 1 — up 2,204,000. One year ago 307,557,000 barrels.*

GASOLINE STOCKS *86,613,000 barrels as of April 8 — down 664,000. One year ago 91,717,000 barrels.*

GAS AND FUEL OIL STOCKS *126,199,000 barrels as of April 8 — down 1,694,000. One year ago 123,439,000 barrels.*

REFINERY RUNS *3,145,000 barrels daily week ending April 8 — down 25,000. One year ago 3,189,000 barrels.*

The weekly Bureau of Mines reports show that the bulk of the additions to crude stocks have been in East Texas, Texas Gulf Coast and California. Outside these areas the withdrawals have exceeded the increases since the first of the year. The upward trend has special significance in Texas where gains in crude stocks averaged 190,000 bbls. daily the last two weeks of March. While the location of increases to storage does not necessarily reflect the point at which the overproduction took place, these data and the statements of large buyers do indicate that a reduction of at least 100,000 bbls. daily is needed in the Lone Star State to balance supply and demand.

For this reason observers state the hearing of the Texas Railroad Commission to be held at Austin next Monday is particularly important. The latest proration order of the commission for April—the third in 10 days—restored most of the reductions that had been made effective by the second order and accounts for a large part of the gain in national production last week.

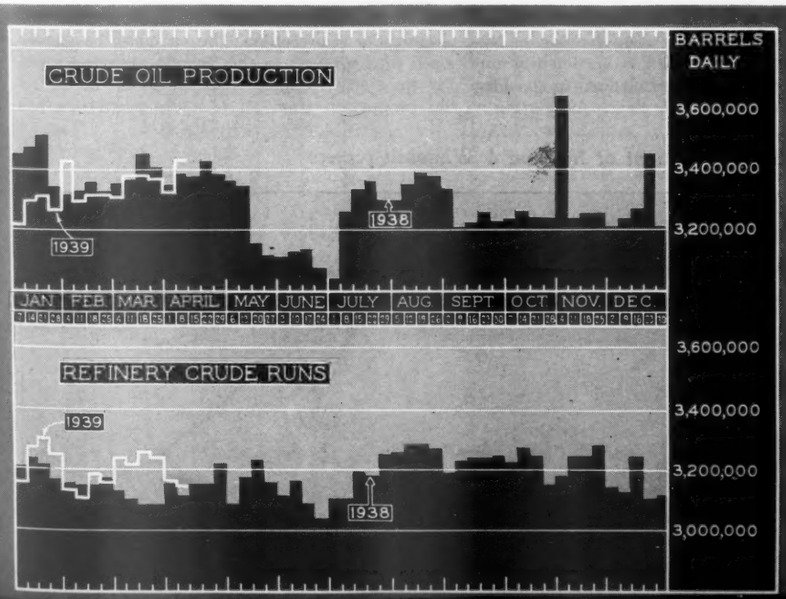
Bearing out statements made at the March hearing there are no outlets for this additional crude. Pipe line proration has widened and several purchasers are running additional crude to storage. These buyers are hopeful that the commission will recognize this situation at the Monday hearing and make the needed adjustments, thus preventing the overproduction becoming more critical. Conditions are similar in California where production continues to be approximately 40,000 bbls. daily in excess of current demand.

Developments in refinery markets are encouraging although the needed quick recovery in prices is still not under way. Gasoline is showing the expected seasonal gains and prices in most areas are either firm or have advanced fractionally. The latest government report covering February operations shows a highly favorable demand situation. For the two months total demand (exports plus domestic) revealed the following increases: Gasoline, 6.5 per cent; kerosene, 11 per cent; gas oil and distillate, 16 per cent; heavy fuel oil, 9 per cent and lubricating oils, 8.9 per cent.

These gains in most cases are due entirely to increases in domestic demand. Gasoline and other exports are running behind last year. The report shows that the improvement in residual oils was outstanding.

DAILY AVERAGE PRODUCTION FOR WEEK

	Apr. 8, 1939	Bur. Mines Apr. est. of demand	Apr. state allowables	Apr. 1, 1939
Oklahoma City	114,500	.....	.....	85,025
Fitts	30,325	.....	.....	30,500
Remainder of state	307,425	.....	.....	306,675
Total Oklahoma	452,250	473,300	428,000	422,200
East Texas	447,086	.....	.....	372,698
West Texas	212,748	.....	.....	211,652
North Central Texas	115,899	.....	.....	115,300
Texas Panhandle	72,348	.....	.....	64,150
East Central Texas	105,100	.....	.....	99,950
Gulf Coast Texas	328,454	.....	.....	361,900
Southwest Texas	108,696	.....	.....	108,798
Total Texas	1,390,331	1,412,700	1,412,090	1,334,448
North Louisiana	73,455	.....	.....	69,215
Gulf Coast Louisiana	192,400	.....	.....	192,548
Total Louisiana	265,855	262,000	257,920	261,763
California	620,500	592,000	575,000	616,500
Kansas	153,800	152,700	156,850	167,000
Arkansas	54,185	53,300	52,993	54,245
Illinois	166,439	149,300	.....	167,311
Eastern fields	98,200	104,800	.....	94,800
Michigan	58,617	48,300	.....	58,080
New Mexico	113,560	115,300	109,700	114,520
Rocky Mountain area	71,460	70,300	.....	70,990
Total United States	3,445,197	3,434,000	.....	3,361,857



Status of Flooding in Northeast Oklahoma

By PAUL REED

In taking stock of what is being accomplished with water-flooding as a means of getting larger recoveries from oil-producing properties, there are several reasons why special attention should be directed to the application of this technique in northeastern Oklahoma.

Water-flooding of the Nowata field, in this area, is undertaken on a greater scale than anywhere outside the Bradford district of Pennsylvania. In fact, until several Nowata projects showed what could be done with flooding in 1936, there was a widespread assumption that this was a secondary recovery method suited only to Bradford conditions. Following the sensational demonstration of that year when a quarter section of stripper property was made to produce over 2,000 bbls. per day, there has been a steady increase in flooding operations in the Nowata area; outside the Nowata field there have been a few scattered flooding operations in northeastern Oklahoma which have been attended with less success; the principal areas affected by Nowata experience are in southeastern Kansas where flooding operations have been stimulated.

Together, the districts mentioned are regarded as the Mid-Continent water-flooding area. Flooding projects in northeastern Oklahoma produce 7,000 bbls. per day; those in southeastern Kansas produce 1,500 bbls. per day. Results obtained have been the outcome of close study and careful planning. Altogether, 5,400,000 bbls. of oil have been produced by flooding in northeastern Oklahoma; this has been done almost entirely in the last three years.

An examination of individual flooding operations indicate that this method of secondary recovery should not be regarded as a sure-shot means for getting oil out of the ground profitably. Because of the close spacing of input and producing wells flooding development requires a substantial investment of between $900 and $1,500 per acre.

In parts of the Nowata field where the sand is approximately 500 feet deep, it is reported it is difficult to keep development costs below $1,200 per acre. Properties and the methods used for flood projects have been selected by successful operators with special regard for the economics of the situation which are affected by the present price of oil, marketing conditions, development, and operating costs and effectiveness of present flooding methods which are regarded as being still in the pioneer stage. It has been estimated that to make a profit by water-flooding with oil

Wooden tanks in foreground used on this lease before water-flooding; steel tanks in background installed to hold increased production resulting from flood

selling for $1 per barrel a property considered for exploitation by this process in the Nowata area should not have less than 15,000 bbls. per acre and that at least 30 per cent of this should be recoverable. However, a number of projects being flooded have less than this.

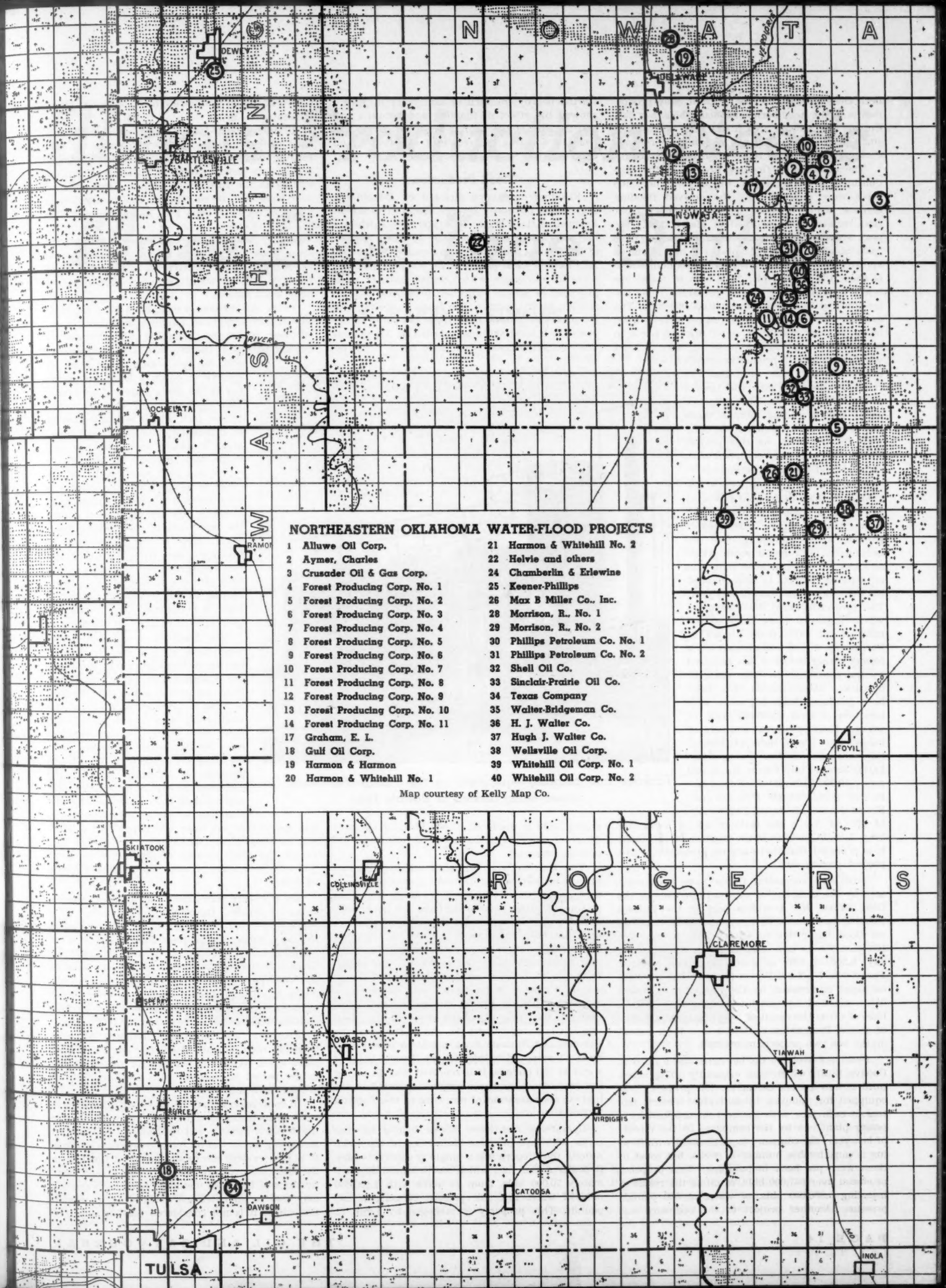
There has been a conspicuous mortality among makeshift or "poor boy" attempts at flooding. And even among projects of experienced operators in such an area as the Nowata field, which has proved to be the most desirable flooding area in northeastern Oklahoma, there has been a wide difference in results. Nevertheless, taken as a whole, what has been done with flooding in Nowata in the last three years is sufficiently impressive to encourage production men to consider water-flooding seriously as a means for getting a greater ultimate yield from producing formations at considerably greater depths than those exploited in the present flooding areas. It has even been stated that the possibilities of water-flooding should be taken into consideration in estimating the oil reserves of the country.

Today there are 40 flooding projects in northeastern Oklahoma in process of development, operating, or shut down and abandoned. Operations are divided among Pennsylvania and New York flooders who have come to this section, major companies, and local producers. More than 5,000 acres are under flood in tracts ranging from 15 to 584 acres; an average project covers 40 acres.

This activity is a direct consequence of the pioneer experiments carried on six years ago by Burt H. Collins and Donald P. Oak at a Carter Oil Co. lease in the southern part of the field; this property is now owned by Whitehill Oil Corp. and designated as Whitehill No. 1. Since the time when flooding began in May 1931, this property has produced over 300,000 bbls. from 125 acres with a water input of over 3,000,000 bbls.; at present it is making about 60 bbls. per day. There has been no uniformity of operating conditions due to changes necessary in the course of experimentation and expansion under the three managements which have had charge of it. However, it is to be noted that the oil-to-water ratio is 1 to 10 which is in line with ratios found on successful recent projects. The average ratio for all northeastern Oklahoma water-floods is 1 to 13.

In surveying the most conspicuous aspects of water-flooding in northeastern Oklahoma today it is observed that the largest flooding operators are Forest Producing Corp. and Phillips Petroleum Co. both of which have projects in the northern part of the field where conditions have been found to be most favorable. In order to give an indication of the vicissitudes as well as the opportunities which go with water-flooding, a brief review of the experience of the Forest Producing Co. is presented. The company has developed nine projects in the Nowata area and vicinity since 1935, ranging from 158 to 584 acres. Total production from all of these properties has

Pumping plant and water-treating equipment at Harmon & Whitehill project



NORTHEASTERN OKLAHOMA WATER-FLOOD PROJECTS

1 Alluwe Oil Corp.
2 Aymer, Charles
3 Crusader Oil & Gas Corp.
4 Forest Producing Corp. No. 1
5 Forest Producing Corp. No. 2
6 Forest Producing Corp. No. 3
7 Forest Producing Corp. No. 4
8 Forest Producing Corp. No. 5
9 Forest Producing Corp. No. 6
10 Forest Producing Corp. No. 7
11 Forest Producing Corp. No. 8
12 Forest Producing Corp. No. 9
13 Forest Producing Corp. No. 10
14 Forest Producing Corp. No. 11
17 Graham, E. L.
18 Gulf Oil Corp.
19 Harmon & Harmon
20 Harmon & Whitehill No. 1
21 Harmon & Whitehill No. 2
22 Helvie and others
24 Chamberlin & Erlewine
25 Keener-Phillips
26 Max B Miller Co., Inc.
28 Morrison, R., No. 1
29 Morrison, R., No. 2
30 Phillips Petroleum Co. No. 1
31 Phillips Petroleum Co. No. 2
32 Shell Oil Co.
33 Sinclair-Prairie Oil Co.
34 Texas Company
35 Walter-Bridgeman Co.
36 H. J. Walter Co.
37 Hugh J. Walter Co.
38 Wellsville Oil Corp.
39 Whitehill Oil Corp. No. 1
40 Whitehill Oil Corp. No. 2

Map courtesy of Kelly Map Co.

been close to 3,000,000 bbls. Present daily production is in the neighborhood of 3,000 bbls. per day. Outside the Nowata area it has been operating a small flood in Creek County and another in Osage County; the latter is reported to be shut down.

The outstanding flooding project in the Mid-Continent is Forest No. 1, Big Creek, where 158 acres were developed by the delayed flooding method. Water injection began in October 1935; first results were observed in March 1936; the peak was reached in August with production over 2,000 bbls. per day. This property has produced approximately 975,000 bbls.; daily production now is about 100 bbls. of oil; 3,000 bbls. of water are injected daily at 570 pounds pressure. Total water injected to date is almost 9,000,000 bbls. The average amount of oil recovered per acre is 6,000 bbls.; average amount of water injected per acre is 54,829 bbls. On this property the 40-acre tract with the smallest production made over 5,000 bbls. per acre and the tract of this size with the largest production made over 7,000 bbls. per acre. During recent months there has been some experimenting done with flowing wells on this project which was originally equipped with conventional pumping equipment.

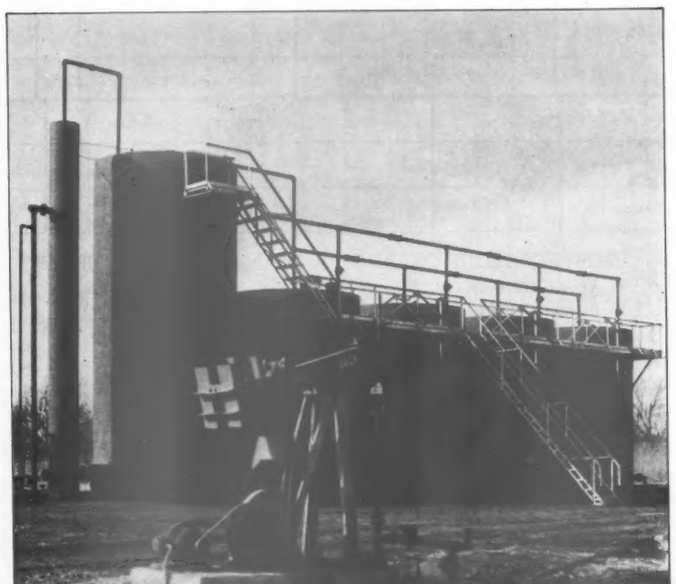
A year after starting Forest No. 1, another flood designated as Forest No. 2 was developed 10 miles south near Alluwe where considerable trouble with channeling was encountered; as a result more water and less oil was produced than was anticipated. Efforts to stop channeling met with some success this year. This project included about 400 acres which produced more than 400,000 bbls. of oil. The flood known as Forest No. 3 was commenced by a former owner before it was acquired by the company. In four years of operation, about 120,000 bbls. have been produced from 160 acres with injection of over 3,000,000 bbls. of water. Four projects, enumerated below, have been light producers; they are: Forest No. 5, 160 acres, 18,000 bbls. of oil; Forest No. 6, 120 acres, 40,000 bbls. of oil; Forest No. 8, 200 acres, 15,000 bbls. of oil; Forest No. 9, 143 acres, 13,000 bbls. of oil. At No. 8 the ratio of oil to water has been 1 to 147 which is the highest in the field; it is reported that there are no prospects of this project paying out.

Two very successful floods have been operated by the company in the northern part of the field. Forest No. 4 offsets part of the Phillips flooding operations. In two years' time this Forest flood has produced 450,000 bbls. of oil from 160 acres; it is now making about 300 bbls. per day; 6,300,000 bbls. of water have been injected. Forest No. 7 offsets Forest No. 1 and is the largest flood undertaken by the company; it covers 584 acres and has produced more than 900,000 bbls. of oil as the result of injecting 9,000,000 bbls. of water. Production is flowed to a large extent on the last two projects mentioned.

Phillips Petroleum Co. has expanded a flood at Coodys Bluff, which was originally 157½ acres, until it now covers 299 acres. The property was equipped for pumping by individual electric motors at each jack with the current supplied by a power plant run by the company. In the middle of last year, the company experimented with flowing a considerable number of wells, but most of them were put back to pumping. This property produced over 557,000 bbls. of oil as the result of injecting 5,800,000 bbls. of water at 500 pounds pressure. Another project of the company was started nearby in April of last year; in June it showed the effect of flooding and between then and the end of the year it produced 16,000 bbls. from 89 acres as the result of injecting 620,000 bbls. of water at 425 pounds pressure.

Flood Production

Flooding operations directed by Donald Oak are carried on under several names. The Walter-Bridgeman flood produced 41,000 bbls. in the last half of 1938 with 550,000 bbls. of water injected at 550 pounds pressure. Up to January 1, 1939, the H. J. Walter flood produced 292,000 bbls. from 205 acres in four years with 2,800,000 bbls. of water injected; at present, injection pressures used are as high as 700 pounds. The Hugh J. Walter project produced 140,000 bbls. from 138 acres in two years with 3,200,000 bbls. injected at 550 pounds. The Wellsville flood is managed by J. L. Wylie; during 1938 it produced 85,000 bbls. of oil from 64 acres with 1,000,000 bbls. of water at 485 pounds pressure.



Tankage and pumping equipment on the Phillips Petroleum Co. leases being flooded in Nowata field

The Harmon and Whitehill interests operate several projects under different names. In nearly three years' time Harmon & Whitehill No. 1 has produced 290,000 bbls. of oil from 115 acres with 2,000,000 bbls. of water injected. Recent pressure used has been 725 pounds. Harmon & Whitehill No. 2 has had difficulty with channeling which was finally eliminated by cementing the casing from top to bottom; this trouble and the time taken to correct it interfered with getting conclusive production results during the past year. Between the time when the effect of the flood was felt last August and the end of the year, the Harmon and Harmon flood produced 16,000 bbls. from 47 acres with injection of 500,000 bbls. of water at 520 pounds. It is reported that, in coring the property, a core was obtained which had the highest oil saturation of any core in the field up to this time.

Operations mentioned above belong to concerns with two or more properties in the field. Among those operating a single property, is Max B. Miller & Co., Inc., which has produced approximately 70,000 bbls. from 70 acres with 1,500,000 bbls. of water injected; present pressure is 500 pounds. This property is managed by Lynn C. Converse. Other properties have produced lesser amounts.

Results reported from floods outside the Nowata district indicate that on the whole the best results obtained so far by flooding have been in the Nowata district. North of Tulsa two floods operating in the Bird Creek sand for more than a year have been of an experimental nature. Oil to water ratios have been 1 to 70 for one and 1 to 237 for the other.

At the beginning of this year the Alluwe Oil Corp. flood had produced over a 14-month period 78,000 bbls. of oil from 100 acres by the injection of 1,000,000 bbls. of water; pressure applied at the plant is 370 pounds.

There is a difference of opinion as to the comparative advantages of pumping and flowing water-flood properties. Pumping aids in getting quicker payout of the investment in the property and, for this reason, there is an incentive to equip a lease for pumping in the early stages of operation. The type of small electric motor-driven jack which is being used to an increasing extent in water-flooded areas is usually mounted on a concrete slab, making it possible to move jack and base readily to another property when the point has been reached where it is more profitable to flow the production during the last years of the flooding operation. Most of the water used in flooding comes from Big Creek and the Verdigris River; shallow gravel beds afford a limited supply. Brine coming to the surface in producing wells is being used on a number of properties for injection purposes.

The Shell flood and the Helvie flood have gone a step further in the use of brine since they are using the Siliceous lime as the reservoir from which salt water for flooding is drawn. Helvie is flooding the Bartlesville sand at a depth of 1,075 feet; most of the Nowata floods have the Bartlesville at depths varying from 400 to 550 feet. The Helvie property is 11 miles west of the main part of the Nowata field; production has been restricted by the pipe line company's proration which has meant that the lease was capable of producing its allowable in six or seven days. For this reason the small amount of production reported gives no indication of what the lease is capable of doing.

On a 40-acre lease, near the town of Alluwe, brine for flooding the Shell project is lifted by a Reda submerged centrifugal pump and carried to the input wells through lines which have been designed as a closed system preventing contact of the brine with the air. Acid is injected into the brine as it leaves the well. Water treatment at most of the leases is accomplished in several different ways. Operators make various uses of aeration, settling, stabilization, chemical treatment, and filtering.

Programs are sometimes designed to meet financial requirements of the operators. In some cases quick pay-out is planned for rather than a longer period of flooding with the possibility of greater ultimate yield.

In conclusion it may be said that, according to present indications, water-flooding operations in the Nowata district will continue to produce an increasing amount of oil for several years to come. It is now evident the requirements of flooding in the Mid-Continent are leading to important modifications of Bradford methods; new developments may lead to an extension of flooding to properties where it is not considered feasible now.

Illinois Production Needs More Pipe Line Outlets

By HARRY F. SIMONS

EVANSVILLE, Ind., Apr. 10.—New fields, extensions to discoveries made in the past two years, and development of deeper pay horizons in the Illinois basin may find the state's production beyond its pipe line capacity before conclusion of the year in spite of the announcement on April 3 that Socony-Vacuum Oil Co., Inc., would install 360 miles of 10-inch pipe line from Wood River, Ill., to Lima, Ohio. (The Oil and Gas Journal, April 6, 1939, Page 17.) Present pipe line capacity is about 80,000 bbls. eastward, with about 110,000 bbls. being sold to eastern refineries.

During the past six months the production in the Illinois area has increased 114 per cent from 77,000 to approximately 165,000 bbls. daily. This increase has been due to the completion of 1,522 oil wells since October 1, 1938, with an average initial production of 380 bbls. The state's production has increased at the rate of 54.1 bbls. per day per well added while the average rate of oil completions over the six-month period has been 58.5 wells per week.

Continuance of this rate over the next six months would result in an increase of approximately 120,000 bbls. daily in Illinois production during the balance of the year. This would amount to a total production of approximately 280,000 bbls. from the state. It is doubtful that the total production will reach that figure this year, 200,000 bbls. being a more conservative estimate, but even this quantity will necessitate more pipe line and refinery outlets.

When the present activity started a little more than two years ago there were several pipe lines crossing the state. Illinois had a main line running north of St. Louis, Mo., to Vandalia, Effingham, and eastward into Lima, Ohio. Stanolind had a crude line running northeast from Wood River to Chicago; Gulf, a crude line running from St. Louis to Cincinnati and Toledo; Shell, a crude line from Wood River into Chicago and a gasoline line from Wood River to Lima and Springfield, Ohio. Texas-Empire had a line from the Mid-Continent going to Rockport, Ill., with an 8-inch spur into the Indian refinery at Lawrenceville.

The Illinois system had three 8-inch lines running east and west including a spur line to Sandoval; a gathering system in the eastern Illinois field; a 6-inch line from Owensboro, Ky., into Lawrenceville where it joined a line from Pike City, Ind., on its way to the main line at Martinsville, Ill. This system has been the main outlet for Illinois crude with as much as 50,000 bbls. being shipped eastward daily from the Brownstown station and approximately 16,000 bbls. daily going westward. In addition approximately 28,000 bbls. come into the line at Martinsville, Ill., for eastward shipment. The Illinois company is acting as common carrier for the shipment of this oil although they do purchase some oil for themselves, mostly at Patoka and Noble with small amounts from Centralia and Louden.

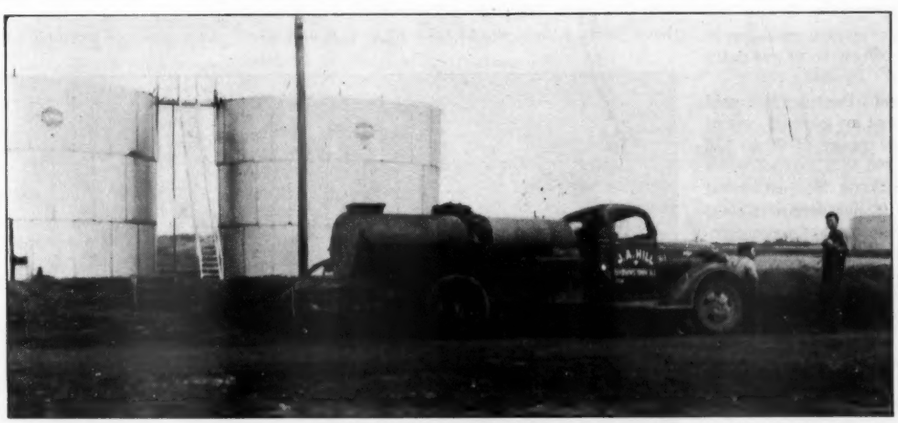
To take care of this crude, the Illinois has added a fourth 8-inch line from Brownstown into Lima, Ohio, the total capacity of the system now being in the neighborhood of 90,000 bbls. daily. It handled up to 70,000 bbls. daily of Mid-Continent crude before looping the line to increase its capacity. The line normally operates at 450 pounds pressure but it has a maximum pressure of 625 pounds. The original equipment was installed in 1915.

Immediately following the major discovery in the lime area, Pure (Wabash Pipe Line Co.) started construction of a 10-inch line from the Clay City field to Martinsville, where it joins the Illinois Pipe Line for shipment to Toledo and Newark, Ohio., where the company has refineries. The line has since been extended into the Fairfield area south of Clay City and recently another pumping unit was added to the Noble pumping station. This line is now handling approximately 28,000 bbls. of crude from the eastern part of the state. About 22,000 bbls. of this oil is produced by Pure and the remainder is oil purchased by the Standard Oil Co. of Ohio (Sohio), which uses Pure's Wabash line as a common carrier. Maximum capacity of the line is about 32,000 bbls. at 1,000 pounds pressure.

Texas Co., through its pipe line, Central States Pipe Line Co., has an 8-inch line into Clay City from Salem, a 6-inch line from North Aden into Clay City, (a 900-hp. unit was recently added to the booster station at Clay City), and a 10-inch line from Clay City into Lawrenceville where its (Indian) refinery is located. The company also has a 4-inch line from Salem to Sandoval where the company delivers to the Illinois and a 6-inch line from the Salem field to a 40-car loading rack on the Baltimore & Ohio Railroad at Salem. The 25,000 bbls. which is shipped by pipe line from Salem to Lawrenceville is transferred to its Lockport refinery through an 8-inch line formerly used to carry oil into Lawrenceville. Another station was added for reversing the line.

The Salem field is also served by the Magnolia Petroleum Co. 6-inch line to Sandoval where it delivers oil to the Illinois Pipe Line Co. for shipment west. Sohio has a 4-inch line from Salem and a 6-inch line from Centralia to Sandoval for shipment east. Globe Refining Co. (Western Pipe Line Co.) has a 6-inch line to the Selmonville siding where it has a 12-car loading rack. Manley Pipe Line Co. has two 4-inch lines into Centralia to a loading rack and four small refineries. Canyon Pipe Line Co. and W. R. Curry each have a 3-inch line to Selmonville siding. About 15,000 bbls. daily are shipped from Selmonville and 16,000 bbls. from Salem by railroad tank car.

Oil from the Louden area is gathered by Oklahoma Pipe Line Co., Sohio, Central Crude Co., Western Pipe Line Co. and Allied Refining Co. In the order named they are delivering approximately the following amounts of oil to Illinois Pipe Line Co. at Brownstown: 16,000 bbls., 6,500 bbls. and 1,200 bbls. Allied refinery delivers approximately 3,000 bbls. of crude daily to its refinery at St. Elmo. Western ships 10,000 bbls. by rail to Lemont.



Oil from the Louden field is delivered to the Illinois Pipe Line Co.'s Brownstown station in tank trucks by some operators

Two outlets through existing facilities may be opened to Illinois crude. One of these is Tide Water Associated Oil Co. 10-inch line that starts in the eastern part of the state and goes east and the other is the 6-inch spur line belonging to Illinois Pipe Line Co. which was used to carry Kentucky production to Lawrenceville and Martinsville. This line is now open on the Ohio River due to the purchase of the Kentucky gathering system by Ashland Refining Co. and some of the Illinois produced crude may ultimately reach the market in barges going up or down the Ohio River. There are several Kentucky refineries located at Louisville, Covington and Catlettsburg.

J. J. Schmidt, East Ohio Gas Co., Cleveland, and Christy Payne, Jr., Peoples Natural Gas Co., Pittsburgh. Mr. Payne is retiring district chairman

Production Topics at Eastern A.P.I.

By J. P. O'DONNELL

PITTSBURGH, Pa., Apr. 10.—A varied program including such distantly related subjects as "corrected" shooting of water intake wells, lubrication, dehydration of natural gas and a study of geochemical methods of prospecting drew a near record attendance to the American Petroleum Institute's Eastern district, Division of Production, annual meeting here this week. Total registration approximated 450.

This highly interesting program was launched with a comprehensive discussion of the Oriskany sand development in West Virginia and the oil and gas possibilities in it and deeper horizons by Dr. Paul H. Price, state geologist. He traced this development from the drilling of the first well in 1912 to the completion in September, 1934, of a 168-bbl. oil well which started the development resulting in the present gas fields. Since 1912, 300 wells have been drilled to this sand, which averages 30 feet in thickness with normally a 5-foot pay, virtually all of them since 1934. Approximately 60,000 acres in Kanawha and adjacent portions of Boone and Jackson counties have been developed, resulting in the development of 2,179,734,000 cu. ft. of gas daily so far.

Concerning drilling methods, Doctor Price said that all is done by cable tools at an average cost of about $3 per foot and a time range of 90 to 120 days. Total costs of these 4,500 to 5,300-foot wells runs between $20,000 and $30,000. He estimated the recovery at 5,000,000 cu. ft. per acre or a total of 300,000,000,000 cu. ft. for the 60,000 acres comprising the Elk-Poca, Campbell Creek and Cooper Creek fields. The area on high structure between the last named field and the head of Tupper Creek may provide large wells if sand conditions are right, he said.

Despite the fact that tests below the Oriskany have not been especially encouraging, the paper, prepared jointly with R. C. Tucker, assistant state geologist, expressed the opinion that these tests cannot be thought of as adequately testing the older horizons which are productive in other states. The authors believe possibilities for production in the Oriskany on many other structures in the state are good, especially for gas, and that production will be found in the Newburg, Keefer, Clinton and possibly Trenton sands, all of which underlie the Oriskany.

Since no one plan is effectively applicable to all properties, because of both vertical and lateral variations in sand characteristics, efficient operation of a water-flood property requires compensation for these variations, Harry M. Ryder, of Ryder-Scott Co., Bradford, pointed out in his paper on "Practical Water-Flooding Efficiency in Oil Production," published on Page 54 of this issue. Some of these variations can be compensated for in a practical manner by shooting according to conditions individually found, by "tailoring" each operation to the sand conditions in each property and in each well, thereby obtaining the most oil at the lowest unit cost.

Spot Pattern

Mr. Ryder favored the four- or seven-spot patterns since, conditions being equal, more oil can be recovered; cautioned against too close spacing since the difference in total drilling cost may mean the difference between ultimate profit and loss and urged proper treatment and pressuring of water in order to prevent plugging and to maintain a regular, vertical flood front. He displayed a number of figures to show the heterogeneous character of the Bradford sand and to show the possibilities of "corrected" shooting, the concentration of the shot at the less permeable lenses. He suggested in these instances the use of a "5½-inch diameter shell (4½ quarts per foot) which will fracture the sand far deeper than a 3½-inch shell (2 quarts per foot) and hence enable far more water to enter the sand at a given pressure. . . . The diameter of the shell and hence the intensity of the shot determines the extent of useful fracturing."

This would result in the highly desirable more uniform distribution of water throughout the sand body, he said. He cited a theoretical example of three wells which would take 62.5, 47.9 and 41.8 bbls. of water per day after uniform shooting, whereas by the use of corrected shooting they would take 39.4, 38.7 and 40.4 bbls. per day. In addition to providing the use of less water more efficiently, this would reduce pumping requirements, Mr. Ryder concluded. In the subsequent discussion, Dr. S. T. Yuster, of Pennsylvania State College, said that a similar effect could be obtained by delayed drilling if equal quantities of water were injected simultaneously into all intake wells.

Most important of recent developments in Michigan is the test of Gulf Refining Co. in Bay County, H. M. McClure, president of the Michigan Oil and Gas Association, declared. This test swabbed 26 bbls. of oil in a six-hour test in the Sylvania sand at 3,955 feet, he said, and makes it seem certain that Sylvania production in commercial quantities will soon become a reality in Michigan. Completion of 1,018 wells, 580 of them oil wells with a total initial of 234,344 bbls., and the production of 18,744,709 bbls. of oil in 1938 set all-time records for Michigan, he said. He cited as outstanding developments the discovery of five new fields in Allegan County, discovery of the Van Horn field in Clare County with wells of 10,000 bbls. initial and better, and the increased interest in deeper drilling which resulted in the discovery of oil in the upper Monroe in Ogemaw, Bay, and Tuscola counties which will likely be developed on account of its close proximity to the potential market.

Mr. McClure's paper concluded with a strong plea for conservation of oil and gas in Michigan. As a concrete example of physical waste, he point-

R. E. Leyendecker, producer, Pelham, N. Y.; J. O. Breene, Petroleum Explosives Co., Oil City; E. H. Messer, National Transit Co., Oil City; F. A. Johnson, petroleum engineer, Oil City; R. B. Bossler, superintendent, Brundred Oil Corp., Oil City

Harvey Johnson and John O'Kain, Belmont Quadrangle Drilling Co., Bradford, and R. O. Borden, American Meter Co., Pittsburgh

George A. Welker, president; D. E. Conway, geologist; J. G. Montgomery, Jr., superintendent, United Natural Gas Co., Oil City, Pa.

ed to the loss of from 500 to 1,000 bbls. per acre in the Crystal, Buckeye, and Muskegon fields as a result of premature depletion and water encroachment, and cited the 60-cent decline in Michigan crude prices against 10 cents per barrel for Mid-Continent crude. He confidently predicted the proposed Michigan conservation bill, which has already passed the house, will be enacted into law within a few days.

Substantial savings are possible through use of high-pressure lines for the transmission of natural gas, John A. Clark, Hope Natural Gas Co., declared in his paper on "High-Pressure Lines—Design and Experience," published on Page 48, this issue.

Three types of plants for the dehydration of natural gas were discussed in a paper prepared by H. M. Baker and J. W. Partridge, of the United Fuel Gas Co., published on Page 50 of this issue.

Formation Plugging

Formation plugging, use of soluble acid pipe, chemical solvents for paraffin removal and improved acid for fast acting limestones were discussed by P. E. Fitzgerald, Dowell, Inc., Dallas, Tex. Formation plugging, consisting of forcing a liquid mixture of plugging material into the pores of a formation carrying undesirable fluid where it sets and forms an impermeable plug, is proving extremely effective, he said. Acid soluble pipe is being used in Illinois where first production is from the Benoist. A section of magnesium alloy pipe is run opposite the higher Weiler and this section can be dissolved by inhibited hydrochloric acid and this formation produced.

Daily average new production in the new Illinois basin fields reached 150,000 bbls. as of March 1, and has an estimated peak of 200,000 to 225,000 bbls. to be reached this year, Ralph E. Damp, eastern division production superintendent, Carter Oil Co., Mattoon, Ill., declared in his paper published on Page 44 of this issue.

After reviewing operating problems, Mr. Damp said, "Pressure maintenance or modified repressuring materially increases recoverable reserves. Restricted withdrawal will insure a more uniform production rate over a longer period of time which in turn tends to stabilize production volume, smoothing out periods of peak production and possible low market values."

With the older Oriskany sand gas fields in the New York-Pennsylvania area now on the decline, cleaning out and deepening has become necessary, John A. Thompson, assistant general manager, Belmont Quadrangle Drilling Corp., Bradford, Pa., said in his paper on reconditioning of these wells. Cleaning out and deepening of these wells has resulted in raising production to as high as 24,000,000 cu. ft. per day in one instance and reaming alone has the effect of increasing production an average of 2,000,000 cu. ft. per well per day, he said.

He discussed the procedure of cleaning out and deepening with a small rotary rotating dry which has resulted in about the same footage as with circulation. This operation, which can be done with cable tools using a lubricator and oil saver, is done under pressure with gas entering the line through a baffled sand trap. He added that in abandoning wells, ripping had been found preferable to shooting in the recovery of pipe.

That industry, oil in particular, should foster favorable public opinion was pointed out by Victor H. Scales, director of public relations, American Petroleum Institute, "A wonderful opportunity confronts business and industrial leaders to create and develop within those spheres of influence which comprise their companies and industries the desire of every man to believe himself to be really a part of it all. It should not be difficult to develop industrial solidarity, industrial esprit de corps, pride of company and of workmanship.

"One cannot regard the oil industry without feeling that these constructive forces should be fostered and encouraged to work out to the fullest extent of their beneficial influences. You and I, who study and know our industry, are proud of it and proud to be a part of it. Yet there are many, both within and without, who do not understand. The result is that our industry is the objective of many attacks upon many fronts," Mr. Scales stated.

Much of the discussion by R. J. S. Pigott and Paul G. Exline, of Gulf Research & Development Co., Pittsburgh, Pa., on bearing lubrication was devoted to boundary lubrication, the region into which only certain oils can carry a bearing without failure. This ability, "oiliness," can be supported by two theories, they pointed out: Selective absorption on the surface of the metal of a film which is only a few molecules thick and increase of viscosity with pressures which may be very rapid with high pressures. While both lack proof, they believed the latter nearer right since it seemed to agree with test results on friction factor produced by oiliness agents.

The term "antifriction bearing" was declared a misnomer since ball or roller bearings at high speeds and heavy loads may have a high friction loss; loss of the viscous shear type is also occasioned by the cage, and a third loss occurs in such a bearing flooded with a lubricant that flows readily and will not channel so that it gets in the way of the balls in excess of the slip-lubrication requirements.

Soil Gas Survey

The principles and methods of soil gas surveys were discussed by Sylvan J. Pierson, head of the petroleum and natural gas department, Pennsylvania State College, who expressed the belief that "soil gas survey is a promising tool for the discovery of the oil and gas pools of the future and it may already be used at the present time for reconnaissance work subject to subsequent checking by other methods of geophysical prospecting."

As advantages over existing geological and geophysical prospecting tools that it possesses he listed: It is capable of discovering oil- and gas-bearing stratigraphic trap structures, the most promising types of oil pools of the future; capable of discovering oil-bearing structures of low relief;

(Continued on Page 26)

Standing: Gordon Gully, Gulf Oil Corp., Pittsburgh; C. A. Young, American Petroleum Institute, Dallas, Tex; E. A. Shakley, Shell Oil Co., Inc., St. Louis. Seated: John A. Thompson, Belmont Quadrangle Drilling Co., Bradford; F. E. Eckert, Hanley & Bird, Bradford, and D. T. Ring, Preston Oil Co., Columbus, Ohio. Mr. Ring is the new district chairman

Sumatra Is Increasing Its Rate of Yield

NEW YORK, Apr. 10.—Despite the absence of major discoveries in 1938 the Netherland East Indies registered another increase in crude oil production. The 1938 yield was approximately 154,356 bbls. per day, an increase of nearly 4,000 bbls. over the daily average of 150,385 bbls. in 1937. As disclosed in the accompanying production table, Sumatra was chiefly responsible for the increased rate of yield with comparatively minor roles played by Java and Ceram. There was a decline of 784 bbls. in the daily average output of Borneo.

The recently discovered Pase field, 55 miles northwest of the Perlak field in North Sumatra, an area discovered in 1937 by Netherlands Koloniale Petroleum Co., has not been yet reduced to commercial exploitation.

One of the factors contributing to increased production from the Djambi district in South Sumatra was the looping of 83 miles of the pipe line with 8-inch serving the district. However, the full benefit of the increased transportation facilities will not be reflected until the current year is ended since the project was not completed until the latter part of the past year.

Northeast of the Kloeang field in Sumatra, the Shell group's operating subsidiary, N.V. de Bataafsche Petroleum Maatschappij, continued active development in the Soengi Lilin field which was discovered during the latter part of 1937.

Five miles southeast of the Benakat field in the Palembang Basin district, Koloniale registered a small discovery in the Selo area, but in the present state of development it appears of minor importance. The B.P.M. (initials for the Shell operating subsidiary) has three new discoveries at Goenoeng Kemala, Talang Djimar and Tandjoeng Miring, all near the Limau field in southern Sumatra.

Much interest this year will center around efforts of the Standard-Vacuum, Dutch Shell and the Standard of California and Texas Co. group to develop production in Netherland New Guinea where an exploratory test is now in progress. Exploratory drilling was started after many months of geological and geophysical work, including air-mapping of the entire region.

A number of minor, largely compensating increases and decreases are noted in the output of the various producing districts in Borneo, Sumatra, Java and Ceram, but, on the whole, the 1938 producing set-up is very much like the 1937 distribution of withdrawals. When the comparison is carried further back, however, a number of significant differences are observed, and, to serve as a foundation for comments on the important changes, the accompanying tabulation showing the daily average rates of production from 1934 through 1938 (with the final year estimated in some instances) is inserted.

NETHERLAND EAST INDIES DAILY AVERAGE OIL PRODUCTION

(Figures in barrels)

	1934	1935	1936	1937	1938
Borneo—					
Tarakan	16,088	16,002	14,557	14,412	14,271
Samarinda	21,607	19,763	20,092	19,705	19,062
Total	37,695	35,765	34,649	34,117	33,333
Sumatra—					
North Sumatra	23,236	19,862	15,346	18,305	20,017
South Sumatra:					
Djambi	6,768	8,222	14,478	19,392	21,404
Palembang ..	46,003	51,657	57,040	57,675	57,900
Total	76,007	79,741	86,864	95,372	99,321
Java	10,373	9,438	10,113	19,544	20,145
Ceram	690	785	943	1,352	1,557
Grand total	124,765	125,729	132,569	150,385	154,356

Borneo

The Tarakan district figures, as given in the tabulation, include the production from the major Tarakan field, and the minor Poeloe Boenjoe field.

The Tarakan and Poeloe Boenjoe fields are situated approximately 20 miles apart on small islands of the same names off the East Borneo coast. The northern end of Boenjoe Island lies approximately 38 miles south of the boundary between Dutch and British Borneo, while the northern end of Tarakan Island lies approximately 50 miles south of the boundary.

The Poeloe Boenjoe field has never been of any importance, having produced only about 85,000 bbls. in its best year, 1933. In the first quarter of 1937 this field produced 2,465 bbls., after which drilling and producing operations were discontinued.

The Tarakan field, on the other hand, has been one of the most important fields in the N.E.I., not only because of its substantial production rate, but also because of the good fuel oil qualities of the crude. During 1934 and 1935 the Tarakan field averaged 15,800 bbls. per day, but in 1936, 1937 and 1938 the production rate decreased to about 14,400 bbls. per day.

The Samarinda district, which includes two of the largest and most important fields of the N.E.I.—Sanga Sanga and Sambodja—is situated on the east Borneo coast in the vicinity of the mouth of the Mahakam River, which lies 250 miles south of the Tarakan field.

The peak year of the Samarinda fields was passed in 1929, in which year the daily average production amounted to approximately 31,740 bbls. Subsequent to 1929, however, there has been a steady decline except for minor upward interruptions in 1933 and 1936, until in 1938 the rate of production had dropped to 19,370 bbls. per day.

All of the production in the Borneo fields is controlled by Shell.

Sumatra

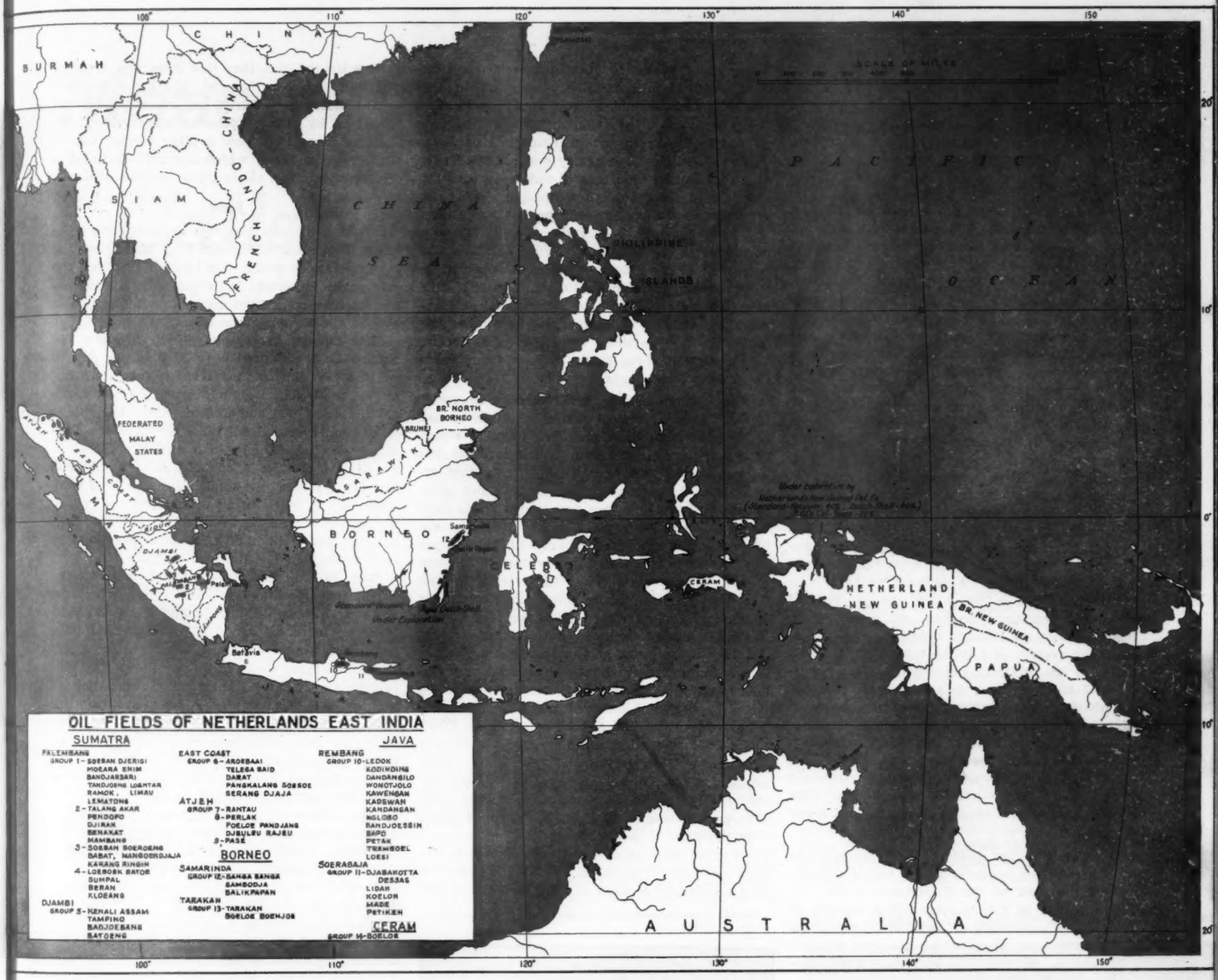
In Sumatra one group of fields is in the northern part of the island, to the north of Medan, and another group in the southern part of the island, in the Residencies of Djambi and Palembang, figures on the South Sumatra subdistricts being given separately.

North Sumatra: Production has been taken from North Sumatra for over 40 years, but the peak year to date has been in 1934, with a daily average production of 23,235 bbls. It will be noted from the tabulation given above that a considerable decrease was shown in 1936 as compared to preceding and following years.

The North Sumatra group of fields includes a number of important producing areas such as

Djapoera camp

Pase camp, Sumatra



Perlak, Rantau, Serangdjaja, Pangkalan Soesoe, Telaga Said and Darat.

The Perlak, Telaga Said and Darat fields have been producing since before the turn of the century and although the two last mentioned fields are now reduced to relative unimportance, the Perlak field still averaged 1,361 bbls. per day in 1937. The Rantau and Pangkalan Soesoe fields are at present the largest producers in North Sumatra, with Serangdjaja in a smaller role.

All of the North Sumatra production is controlled by Shell except for a small field recently opened up by Netherlands Koloniale Petroleum Co. (Standard-Vacuum Oil Co.) in the Pase area, 53 miles northwest of the Perlak field of the Shell. The Pase field is still in the development stage and is not yet on commercial production.

South Sumatra: The fields of the Residencies of Djambi and Palembang, in South Sumatra, are all in the same major geological basin, but as the Djambi development has been carried out by a company in which the Netherlands East Indian Government is a partner with Shell, whereas the Government is not a direct partner in any of the Palembang developments, these two groups of fields are always treated separately.

Djambi: The Djambi concession which covers 1,746,000 hectares, is immediately north of the Palembang Residency, and the major lines of folding extend directly from Palembang into Djambi. Although a large number of well-defined anticlines have been mapped in the Djambi concession area, only four producing fields have been developed to date, viz. Betoeng, Badjoebang, Tempino and Kenali Assam. All four of these fields are in the southeastern part of the concession, near the Palembang boundary.

Increase in Djambi

The Betoeng field started producing in 1923, the Badjoebang field in 1927, and the Tempino field in 1931. The Kenali Assam field made a very small amount of production in 1931 but it was not until 1935 and 1936 that this field became commercially important.

From the tabulation, it will be noted, a very considerable increase took place in the Djambi producing rate in 1936, with further increases in 1937 and 1938. It is to be noted an additional pipe line outlet was completed in the latter part of 1935, with a further increase in capacity being effected by completion of a steam booster station in October, 1936. Moreover, plans were made in 1937 to add 83 miles of 8-inch loop and to replace the temporary steam booster station with a permanent motor-driven pump station. This expansion was completed in 1938.

Palembang producing history runs back prior to 1900, but it was not until 1929 that this district produced over 7,360,000 bbls. per year. In the earlier years the Sumpal, Babat, Soeban Boeroeng and Karang Ringin fields, in North Palembang, and the Moeara Enim-Soeban Djerigi group of fields, in South Palembang, all controlled by Shell, accounted for bulk of Palembang output.

The Sumpal field had already passed its peak in 1900 but produced at substantial rates for many years thereafter, and in 1937 still averaged about 60 bbls. per day.

Babat appeared in the producing list in 1901, and showed production high points in 1913, 1919 and 1926, but after 1926 the decline, although gradual, has been steady. In its best year, 1919, this field averaged 1,470 bbls. per day and in 1937 the daily average production still amounted to 265 bbls. per day.

The Karang Ringin field had its best years between 1903 and 1910, after which a more pronounced decline set in, but this field did not drop completely out of the producing picture until 1933. In its best year, 1907, this field averaged 390 bbls. per day.

The Soeban Boeroeng field started producing in 1914 and had its best years between 1919 and 1925, after which a gradual decline has been continuous except for a small upward swing in 1930. At its high-point in 1922, this field averaged 1,385 bbls. per day. The 1937 average of this field amounted to 310 bbls. per day.

The Moeara Enim and Soeban Djerigi fields,

situated in South Palembang, are the best fields in the southern group. Moeara Enim started producing in 1899 and in the 12-year period between 1900 and 1911 the total Moeara Enim production works out to a general daily average of approximately 2,615 bbls.

Soeban Djerigi District

The Soeban Djerigi field started producing in 1905 and in 1919 the field averaged 2,770 bbls. per day but by 1914 the average rate of production had dropped to 930 bbls. per day. A recovery to 2,050 bbls. per day occurred in 1916, after which another decline set in, and, by 1921, the average rate of production had dropped to 1,285 bbls. per day. From 1922 to 1929 a prominent, steady rise in producing rate took place, which carried the field to its peak production rate in 1929, namely 6,683 bbls. per day. From 1930 to 1935 the trend was again downward to an average of 2,095 bbls. per day in 1935, with slight recoveries to 2,210 bbls. per day in 1936 and to 2,670 bbls. in 1937.

The Kloeang field started producing in 1914 but prior to 1924 the best annual production averaged only 30 bbls. per day, and from 1924 to 1927 inclusive the best year showed an average production of only 1,025 bbls. per day. In 1928 the rate of production jumped to 2,410 bbls. per day and further to 4,560 and 6,735 bbls. in 1919 and 1930 respectively. A set-back to 2,825 bbls. per day occurred in 1931 which was due to legal rather than operating troubles, but from 1932 to 1936 inclusive, the Kloeang field registered a general daily average of 8,345 bbls. per day. In 1937, however, the production slumped to an average of 4,445 bbls. per day, as a consequence of the delimitation of the productive area and the rapid advance of salt water contamination.

In the area northeast of the Kloeang field, Shell has developed new production in the N.E. Palembang complex, which, in 1935, 1936 and 1937, amounted to a total of 586,406 bbls. This production presumably comes from the new Soengei Lilin field.

The Talang Akar field of the Koloniale was worthless in the horizons which had previously yielded the bulk of the Palembang district oil, but deepening of Talang Akar No. 4 resulted in discovery of a prolific new series of sands. Talang Akar No. 4 was completed as the first commercial producer in this field in January 1923. Due to time required to drill enough additional wells to prove the existence of a commercial body of oil and to install pipe line outlet and refining facilities, the Talang Akar field did not produce any considerable amount of oil until 1927, in which year withdrawals averaged about 3,125 bbls. per day. From 1928 on, however, the rate of production increased steadily to a high point of approximately 24,195 bbls. per day in 1935. Withdrawals during 1936 and 1937 were at the rate of about 23,510 and 21,620 bbls. per day, respectively. Present production is about 24,000 bbls.

In 1930 the Djirak field appeared on the production list on a small scale and in 1933 the Benakat field appeared as a somewhat more important prospect. The Djirak field is 6 miles west of the Talang Akar field and the Benakat field 5 miles southwest of Djirak. All three fields are subsidiary parts of the major Boekit Pendopo-Limau anticlinorium and all three produce oil of essentially the same quality from the formation first proven productive by Talang Akar No. 4.

Subsequent to 1933 the Djirak and Benakat fields were steadily developed, until, in 1937, these areas averaged approximately 7,030 and 15,950 bbls. per day, respectively, and the present rate is about 5,785 and 11,720 bbs. per day, respectively.

The Talang Akar, Djirak and Benakat fields are entirely controlled by Netherlands Koloniale Petroleum Co. (Standard-Vacuum Oil Co.) and this group of fields constitutes over 99 per cent of the American controlled production in the Netherland East Indies, the small remainder being represented by Koloniale's very small production in three unimportant fields in East Java.

The Koloniale has recently made a small new discovery in the Selo area, 5 miles southeast of the Benakat field, but the prospects on the basis of present indications appear to be of minor caliber.

The Mangoendjaja discovery of Shell, 30 miles northwest of the Talang Akar field and 22 miles southwest of the Kloeang field, first appeared in the producing column in 1935 and in 1937 this new field averaged 2,374 bbls. per day. The Mangoendjaja field is of particular interest because of its position between the Babat and Karang Ringin fields. These fields produce from above the Talang Akar horizons.

The Limau field of Shell, 25 miles southeast of the Talang Akar field of the Koloniale, on one of the prominent lines of folding forming a part of the major anticlinorium which includes the Talang Akar, Djirak and Benakat fields, first appeared in the producing list in 1928 but after averaging 2,920 bbls. per day in 1932, this field dropped off rather rapidly and in 1937 the rate of production amounted to only 1,015 bbls. per day. It is of interest to note that Shell has recently made three new discoveries in the Goenoeng Kemala, Talang Djimar and Tandjoeng Miring areas, all adjacent to the Limau field, within radii of 6 and 15 miles so that this area appears destined to become of greater importance.

In connection with the Moeara Enim and Soeban Djerigi fields mentioned in connection with the earlier history of the Palembang district, reference should also be made to the Tandjoeng Loentar field, 9 miles west of the Moeara Enim field. This field was developed to a peak production of 2,170 bbls. per day in 1931 but the 1932 rate of production amounted to only 1,035 bbls. per day and by 1937 this had dropped to 410 bbls. per day.

A small amount of new production has also been recently developed in the Moeara Enim district on acreage granted to Shell in 1931, as evidenced by the fact that this item was credited with 69,470 bbls. in 1936 and 152,110 bbls. in 1937.

The East Java district has recently been rejuvenated by new supplies of oil developed by Shell as a result of new drilling carried out in the Kawengan area, which formerly included a disconnected chain of six partly exhausted fields.

Java

About 30 more or less separate producing areas have made some oil in the long history of the Java operations which date back to 1889, but the only really important individual amounts of production have come from a very few fields: Ledok, Nglobo, the Kawengan and Soerabaja group.

The Djepon concession, which includes the Nglobo field, produced only 80 bbs. per day in its best year during the period 1900 to 1909, but in 1911 the withdrawals increased to 395 bbls. per day. Between 1911 and 1927, then, the best year's production averaged 831 bbls. per day. In 1928 a sharp increase started which carried the area to an all-time peak of 4,705 bbls. per day in 1930. The best years of the total life of the area were from 1929 to 1934, during which time the rate of production ranged between a low of 3,703 bbls. per day and a high of 4,704 bbls. per day. By 1937 production has dropped to 1,670 bbls.

The Panolan concession, which includes the Ledok field, produced at rates ranging between 390 and 770 bbls. per day during the period 1900-1913. An increased range of 1,130 to 1,345 bbls. per day was in effect from 1914 to 1919 and a still further increase occurred during the period 1920 to 1930 which carried the rate of production as high as 4,020 bbls. per day. A sharp drop to 1,460 bbls. per day occurred in 1931 and since 1931 the trend has been irregularly up and down. During the period 1931-1937 production dropped as low as 415 bbls. per day (in 1933) but a recovery to 1,573 bbls. per day occurred in 1937.

The Tinawoen and Wonosari concessions, which include the Kawengan group of fields—Kedewan, Dandangilo, Wonotjolo, Kawengan, Wonosari, Kidangan, all of which are situated on one major fold—produced less than 742 bbls. per day from 1900 to 1906. From 1907 to 1918 the rate of production was on a somewhat higher plane, viz.: 920 to 1,425 bbls. per day. The years 1919 to 1920 registered sharp increases to 1,965 and 2,300 bbls. per day, respectively. A recession then occurred from 1921 to 1927 (range of 1,245 to 1,620 bbls. per day) but in 1928 a very prominent period of higher production started which carried the field to a new high point of 4,895 bbls. per day in 1935. The new drilling campaign referred to then increased the rate of production to 5,787 bbls. daily in 1936, and further to 14,373 bbls. daily in 1937.

The Soerabaja fields have been steady small-scale producers for many years and the only item of recent interest is an increase of some relative importance in the Djabakota concession, which covers fields immediately south of Soerabaja. In this case the rate of production was increased by new drilling from 290 bbls. per day in 1935 to 630 bbls. in 1936 and to 1,217 bbls. per day in 1937.

The best of the older fields in this group is Made, but this field has never averaged more than 920 bbs. per day in any one year.

Ceram

The Ceram production is limited to a small area in the eastern part of the island. This area is of very minor significance in the general picture, but a 43 per cent increase occurred in 1937 as compared to 1936, and there has been a still further improvement in 1938. The island of Ceram is over 930 miles east of the Samarinda district of Borneo.

Obituaries

HARRY ROSS, 77, president of Maloney Tank Manufacturing Co., Tulsa, died at Long Beach, Calif., April 9. He was formerly with Oil Well Supply Co. in the Bolingreen and other oil country points in the late nineties and was transferred to the Mid-Continent as manager for the Independence, Kans., store, under P. J. White, district manager. He moved to Tulsa in 1908, became associated with H. F. Sinclair and P. J. White in oil development in the Flat Rock field north of Tulsa. With O. W. Maloney he organized Maloney Tank Manufacturing Co. in 1909 and was secretary and treasurer for a number of years. At Mr. Maloney's death in 1919, he became president.

FOREST E. WOOD, 84, of De Golia, Pa., for 63 years an operator on the Bradford field of northwestern Pennsylvania, died April 5.

WILLIAM DOUGLAS CHEW, 65, attorney and pioneer oil operator of Shreveport, died suddenly in New Orleans, April 7.

WILLIAM F. COAST, 88, pioneer oil producer in the Allegany and Bradford fields, died in Olean, N. Y., on April 1.

Monopoly Committee Calls Oil Industry

By HENRY D. RALPH

WASHINGTON, D. C., Apr. 10.—The oil industry has been designated by the Temporary National Economic Committee to tell its own story of industry conditions under the general head of monopolistic practices and restraints.

Hearings will be scheduled within six weeks and the witnesses will all be members of the oil industry. This is a reversal of the procedure which T.N.E.C. has been using in its monopoly study under which government agencies worked up cases on various industries and submitted them to the committee with very little chance for the industries to offer rebuttal.

Under the new procedure, of which oil will be the first example, industry will present its own case and government agencies will offer additional or rebuttal evidence if this is considered advisable. The new procedure was adopted partly to avoid charges of persecuting business which have been made against some of the T.N.E.C. hearings, particularly those conducted by the Federal Trade Commission, and partly to conserve funds and speed up the inquiry. Congress has agreed to give T.N.E.C. an additional $600,000 for its monopoly study but with the implied understanding that no additional funds will be given in the future and that the committee will conclude its studies and make a report early next spring. A preliminary report covering hearings held to date probably will be made within a couple of weeks.

Several government agencies cooperating with T.N.E.C., particularly the Department of Justice, have already collected a lot of data on the oil industry and this information will undoubtedly be turned over to T.N.E.C. as a check on the evidence submitted by the industry. Under the new procedure oil industry witnesses will submit written statements in advance and will then be subpoenaed to present their testimony orally and with advance information as to cross-examination to be expected from committee members.

The announcement of the oil investigation was made today by Senator Joseph C. O'Mahoney of Wyoming, chairman of T.N.E.C., who issued the following statement:

Chairman O'Mahoney's Statement

The committee has authorized me to announce a new phase of its studies particularly designed to afford business and industry an opportunity, in cooperation with the committee, to present its own story of the nation's economic problems.

For the inauguration of this new phase of the committee's work the oil industry has been selected. Numerous conferences have been held with representatives of both big and little business of varying or conflicting views in this industry, and invitations are being extended to them to assist in designating witnesses who will appear to present to the country and the committee their views and facts with respect to the economic problem.

To indicate the manner in which this program has been developed, it may be stated that Axtell T. Byles, president of the American Petroleum Institute, has consented to seek the cooperation of various leaders in the industry. These persons will be given the opportunity to present prepared statements to the committee and then will be subpoenaed to appear in person at the hearings. The committee will call other witnesses to make certain an adequate presentation is made of all available information with respect to the manner in which the oil industry is conducted.

Interest will naturally center on problems of production, refining, transportation and distribution, with particular reference to the effect upon employment and upon the prices charged for the finished product, as well as the effect of industrial and corporate organization upon the industry. What is the exact relationship between the independent producer and the independent distributor upon the one hand and the major units in production and distribution upon the other? What restraints, if any, exist upon free enterprise? These and many other similar questions constantly being propounded will be presented and studied.

The committee's offer is made without limitation as to the content of the testimony or reports, except that the material presented include data requested by the committee and that opinions, including any criticism that may be made of existing governmental or intra-industry policies, be supported by actual evidence.

From the date on which the committee was organized it has been intended to provide a distinct method of nongovernmental presentation to the committee. The program now announced offers that opportunity. It will make possible the presentation in a forum, which is so situated as to command national attention, varying opinions by business and industrial groups or leaders with respect to the cause and cure of our economic ills. It is not possible at this time to state how many separate industries will be heard in this manner, because there is a natural limitation of time and money, but it is believed that the study of the oil industry will make possible a thorough-going test of this procedure as a means of developing objective testimony.

The projected oil hearing will be the first hearing conducted by the committee itself. Heretofore the presentations which have been made have been presented and directed by the executive departments and commissions which are represented on the committee. These presentations have not been concluded. Some are still in preparation and will shortly be presented at public hearings, but the committee has authorized this announcement in order that its intention to make a well rounded study of the economic problem should be generally known.

It is the hope of the committee that the presentation of the oil hearings may be begun not later than the first of June, but ample opportunity will be given to the witnesses to prepare. Written statements will be filed with the committee at a specified date in advance of hearings, so that the members of the committee and its staff may thoroughly review the material to be presented. The witnesses will then be informed well before the hearings as to the general nature of the questions to be asked by or on behalf of the committee.

The order of appearance of witnesses will be directed by the committee, and every effort will be made to arrange the hearings in such a manner as to afford the most effective and fair presentation of conflicting views.

It should be understood that the committee has not yet planned similar presentations by any other industry or business. It will, however, entertain applications for similar hearings. It was felt that the opportunity should be offered, leaving entirely to business and industry the decision whether this procedure would be helpful.

Industrial leaders or groups which feel that they may make a contribution to the solution of their own or the nation's problems by taking advantage of this formula may make application to the committee through the chairman or the executive secretary for an opportunity to be heard on the general basis outlined in this statement. For the present it is possible for the committee to consider only presentations by or on behalf of specific industries. Later on it is expected that provision may be made to take more general testimony.

In cases where hearings cannot be held due to limitations of time, it is hoped to make arrangements to receive testimony through reports, and the committee expressly reserves the right to receive the material submitted either via hearings or reports or both. This program is undertaken without limitation as to other investigations which the committee may be pursuing or expects to pursue.

I am happy to be able to say that this plan has been received with approval by spokesmen for all factors of the oil industry who have been interviewed.

Dumping Duty in Canada On Under Priced Crude

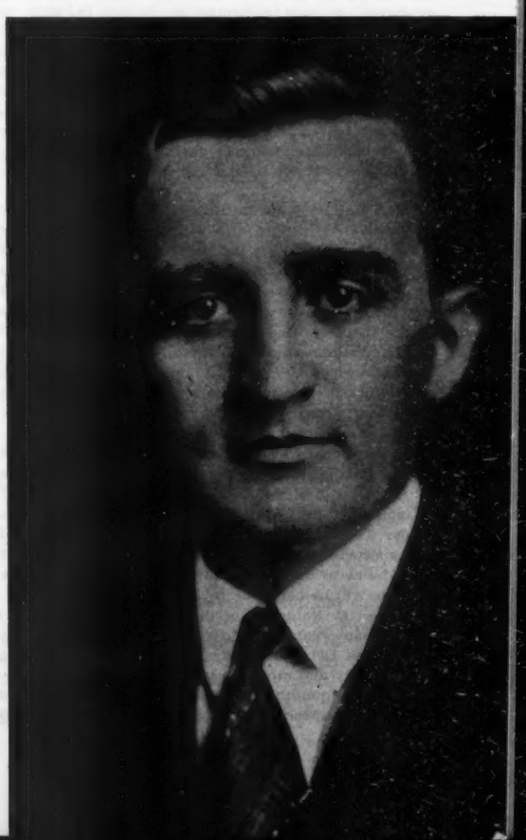
A finding that crude petroleum is subject to the Canadian antidumping law and may be subjected to a special dumping duty if imported into Canada at less than its fair market value has just been made by the Canadian Government. The report states:

"Under a ruling of the Customs Division of the Department of National Revenue crude oil is considered a commodity of a class or kind produced or manufactured in Canada and will be so considered for customs purposes on and after April 22, 1939.

"Crude oil has been ruled to meet the requirement in the customs act that domestic production be sufficient to supply 10 per cent of the normal market requirements of Canada.

"Crude oil enters Canada free of duty and the only significance of the 'Made in Canada' ruling is that in the future imports of crude oil will be subject to dumping duty if sold in Canada at less than the fair market value prevalent in the country of origin."

T.N.E.C. CHAIRMAN—*Senator Joseph C. O'Mahone*



ILLINOIS

THE LEGISLATIVE COMMITTEE investigating oil production and marketing in Illinois preparatory to the consideration of the flock of bills that have been or may be introduced in the state legislature was in session a part of last week in Salem, Marion County, the heart of Illinois 80,000-bbl. oil field.

The senate-house committee created by the Tuttle-O'Neil bill and headed by Representative Oral P. Tuttle of Harrisburg, thus far has heard proration or conservation praised in sworn testimony as necessary to insure:

1. The greater recovery of oil from the Illinois pools.

2. More sound development of the basin.

3. The construction of refineries, not now being built because of the possible instability of Illinois production.

4. A cure for pipe line proration—limitation by pipe line companies on their daily purchases of oil—which was branded the "worst kind of proration."

The committee listened to testimony of the field heads of most of the large oil companies and pipe line companies in the state and to individual producers and oil buyers. The question of whether or not a conservation law should be enacted, and curbs placed on production and well spacing, was paramount.

Robert McIlvain, Jr., who is in charge of Pure Oil Co.'s operations in Illinois, was the only witness up to the close of this report who openly opposed proration of production. He said his company held that there should be no curtailment of production in a state where consumption exceeded production. Mr. McIlvain said his company was producing about 26,000 bbls. a day in Richland, Clay and Wayne counties, in the deep part of the central basin and that it did not prorate its wells. Witness said one of the problems in the field was the sale of oil under the market but believed that the average "hot" oil price had recently been increased, and that it is now up to 80 cents per barrel.

It developed in the course of the testimony of W. C. Kneale of Mount Vernon, representing the Texas Co., that his company had a 40,000-bbl. production per day in Illinois.

C. F. Buchner, of W. C. McBride, Inc., favored a conservation law that would give operators enough production to permit owners to get back a substantial part of their drilling costs before proration became applicable.

William A. Watkins, of the Carter Oil Co., said that pipe line proration was "the worst kind." Regarding proration, he said, refineries could not be built in Illinois when stability of production had not been established. He recalled that Illinois was third among oil-producing states after the first development in 1906 but the uncontrolled production dwindled until new discoveries in 1936. He also said more oil would be produced over a longer period if there were production control. Mr. Watkins gave the Carter Oil Co.'s production as 17,000 bbls. a day from over 400 producing wells.

Mr. Watkins explained that the whole basis for proration was supply and demand. The Bureau of Mines secures data on the petroleum needs and from its estimates production in states with proration laws is determined, he said. Proration might give Illinois less rapid but more sound development and the future of the industry would be better, he said.

Mr. Watkins was an advocate of repressuring and he explained the system used in Fayette County. He added that the company plans to drill 38 more input wells in the near future in carrying out its repressuring development.

New refineries in this area have established customers in Oklahoma and Texas, he said, and they are reluctant to give up these customers for what may be temporary petroleum supplies from the new Illinois fields. Through conservation more permanency could be expected, he said. "The people in Mattoon won't even build us houses because they don't know how long we will be here," he said.

Ernest G. Robinson, of the Shell Oil Co., Inc., said his company had about 5,200 bbls. production per day from about 100 wells. Some of the wells were flowing full capacity and others prorated.

E. J. Bergundthal of the Continental Oil Co. said he could not speak for his company on the question of a proration law but that he favored legislation regulating well spacing to get away from the nuisance of school lots, church lots, graveyards and narrow lanes. He thought wells should be at least 660 feet apart. He opposed taxes on leaseholds of unproductive acreage on the ground that no fair estimate of value could be reached and favored instead a production tax to be paid by operators on their seven-eighths of the revenue and by the royalty owner on his one-eighth.

E. E. Welch of the Illinois Pipe Line Co., a subsidiary of the Ohio Oil Co., said the Illinois pipe line was a common carrier. C. C. Carroll of the Ohio Oil Co. said his company had 80,000 acres under lease in the southeastern part of the state and 240,000 acres in the basin, but that its greatest production was in Texas. He said the Illinois Pipe Line Co. was taking 55 per cent of the Bartelso field production; 55 per cent of the Patoka production and two-thirds of the production of the old Illinois fields. As a common carrier it transports a large part of the basin production delivered to it by other purchasers. Mr. Welch testified his company would probably be for a conservation law which might have proration as a feature for orderly development, and the recovery of all of the oil possible from a property with the prevention of waste.

Frank Wilson of Owensboro, Ky., vice president of the Sohio Pipeline Co., said its gathering system carried about 32,000 bbls. of oil daily, approximately one-fifth of Illinois production.

"We prorate production because we can't buy more than we can dispose of," he said.

The company is a subsidiary of the Standard Oil of Ohio and much of its crude is sold in Ohio.

The pipe line, he said, is transporting about 2,000 bbls. of 90-cent oil per day. Some of the operators who want to run oil although they have no market for it have offered it for 90 cents and it is bought for storage at that price, he explained.

All production carried by the pipe line is prorated, both from independent and major company operations except where special arrangements have been made to take capacity production from wells which are not limited because other wells are draining the pools.

He said his company probably would favor a sound program of conservation.

Following the testimony of the representatives of the major companies the committee started to receive that of the individual operators and firms and small companies in the big basin area.

STATE CAPITALS

WILLIAM J. ARMSTRONG, state conservation officer of Oklahoma, was born on a farm near Magnolia, Columbia County, Arkansas. He graduated from the University of Oklahoma with a degree of bachelor of arts in 1914, and received a degree of bachelor of laws in 1916 in the same university. He did not practice law as he was already in the oil business and remained in it in a practical way until he was made state conservation officer in 1925, a position he has held ever since under various conservation commissions.

TEXAS

RAILROAD COMMISSION OF TEXAS, following the decision of Judge T. M. Kennerly of the U. S. District Court at Houston, Tex., revised its proration orders for April. Judge Kennerly, on April 4, granted a temporary injunction restraining the commission from enforcing its proration orders in five southern Texas fields on petition of Harrison Oil Co. and Abercrombie Oil Co., thereupon the commission increased the allowables in West Texas and South Texas with the result that instead of an actual allowable of about 1,269,000 bbls. per day the state will have an actual allowable of about 1,412,090 bbls. per day.

No change was made in the Panhandle basic allowable of 88,996 bbls. nor the East Texas allowable of 522,110 bbls. North Texas was cut from 117,654 bbls. to 115,243 bbls. and West Central Texas from 66,311 bbls. to 66,818 bbls. West Texas was increased from 168,030 bbls. to 233,540 bbls. East Central Texas was lowered from 121,437 bbls. to 121,066 bbls. Southwest Texas increased from 229,067 to 297,299 bbls. and the Gulf Coast, which had been cut to 188,569 bbls., was increased to 249,930 bbls.

The revocation of the Saturday shutdowns remains in force, but the fields will be shut down on each of the five Sundays in this month. All the above basic figures are greatly reduced when they are computed on a basis of the five-day shutdowns.

CALIFORNIA

CRUDE OIL PRODUCTION in California during the first week of April indicates that the line of greatest resistance has been reached in California curtailment. Despite the setting of 575,000 bbls. per day as the maximum allowable for the month of April, actual production has been averaging over 620,000 bbls. daily. The California situation is slightly improved, however, due to increasing consumption, and it may be possible that with increased business Pacific Coast markets will escape price recessions until next winter. The period of lowest consumption is usually in January and February after which it begins to increase until it reaches the summer peak demand and then progressively declines. Failure to reduce crude oil production below 600,000 bbls. per day has not been due to any lack of perseverance on the part of E. E. Pyles or any of the other curtailment executives. Operators in the Wilmington field held a primary meeting in the past week in an effort to reduce field production but no decision was reached due to the absence from Los Angeles of several production executives of some of the largest individual producers. Another meeting will be held this week.

The Wilmington field, which has an allowable production of 66,225 bbls. per day for the month of April, was producing 87,705 bbls. on April 7 at the end of the first week of the month.

the OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

Published weekly by The Petroleum Publishing Company at Tulsa, Oklahoma

Stick to the Facts

The oil industry in being selected by the Temporary National Economic Committee to be the first to present its story has been afforded an opportunity.

The committee, whose main objective is to determine the present status of monopoly in industry, has been, so far, securing its information from sources which have been directed by government departments and now purposes to go directly to the industries themselves and let them tell their own story.

The greatest danger to the industry in this procedure lies in the confusion which has resulted too often in the past.

The industry often times has presented a great array of information which the investigators, not previously familiar with the industry's operations, did not have time or the facilities to assimilate adequately.

Quite properly, in this case, the committee proposes to give everyone an opportunity to present his views, or grievances, if any. This probably will include those seeking to embarass the industry with extraneous testimony.

Within an industry as widely scattered with as many ramifications as the oil business there are certain to be variations in opinions. A dispassionate analysis of these differences will show they have no proper place in this investigation.

Here is a case where everyone who believes in free enterprise stands on common ground faced with the threat of federal encroachment. There is no essential difference in position between the small independent operator of a filling station or stripper well and the large integrated organizations.

What the committee really wants to know is whether there is competition within the industry. Interwoven with this main objective, are questions which have to do with the conservation of a natural resource; treatment of employes; operating efficiency with particular references to waste; excess profits and, more important than all, the prices at which it makes its products available to millions of consumers.

There is nothing complicated as to the industry's position in these matters and they can be analyzed and summarized in a few thousand words. Fortunately the records of several departments of the Government can be used as exhibits in the presentation of testimony.

The tens of thousands of individuals and companies engaged in production and marketing and the hundreds of refining, natural gasoline and pipe line operators answer the question in regard to competition.

The remarkable achievements in producing practices and the increased yields of the most important refinery products are conservation accomplishments which can be explained so that any one can understand and appreciate them.

The industry's wages and salary scales are at the top of the list of all industry.

Latest federal statistics show that the petroleum products index is but 51.5 of the 1926 level of 100 which compares with an index of 77.5 for all commodities, indicating the cheapness of petroleum products despite the fact that their prices incorporate the heaviest taxes paid by any industry.

These are the fundamentals in which the committee is interested. Operators in all branches of the business welcome the opportunity to give an account of their stewardship.

It behooves the industry to do whatever is necessary to see that the facts are clearly presented and to assure this will not be another investigation that is allowed to run off at a tangent of trivialities.

Well Drilled Horizontally Yields Good Producer

McCONNELSVILLE, Ohio, Apr. 10.—Leo Ranney reports the world's first horizontal oil well on the Dion S. Birney farm, Morgan County, Ohio, in the first Cow Run sand with 15 vertical feet of pay. It has two branches, one 800 feet deep, the other 953 feet deep. The well, he states, has 1,100 feet of pay sand exposed. It has 3 feet of casing, no derrick, no power, no sucker-rods, no shackle-rods, no pump. Pennsylvania Grade oil flows from the well by gravity.

Drilling was made possible, Mr. Ranney says, by his invention for instantaneously controlling the direction of a diamond bit and automatically surveying the hole with each core. The lowest point in the hole was 17 inches below the mouth of the well. It was drilled from 50 to 106 feet in a seven-hour shift and took unbroken cores 31 feet long.

The field was developed 60 years ago and later operated by vacuum and pressure, one well per two acres, but long since abandoned. The horizontal well passes between old vertical wells. When the well was six months old, before shooting, it produced 9 bbls. of oil in seven hours. It was loaded and shot March 29 by F. D. Bickel and Bob Earich of the du Pont company. The mechanical work of loading and cleaning was performed by O. C. Barnett of Hoffman Brothers Diamond Drilling Co., Punxsutawney, Pa. The hole, 2½ inches in diameter, was loaded at the back end with 80 per cent high-velocity gelatine 2¼ inches in diameter and 565 feet long in fibre cartridges each 60 feet long. The line of TNT extended from the far end of the shot to the mouth of the well, where it was shot electrically. The shot was stemmed with water under 200 pounds pressure. Forty representatives of major companies and individual operators witnessed the shot. Seismograph instruments measured the jump of ground surface 220 feet above the shot as 1⅛ inches.

The well, Mr. Ranney says, blew for 20 minutes then flowed by heads every 40 seconds for a half hour. It did not bridge. The day after the shooting it produced at the rate of 1 bbl. of oil every five minutes before sanding up. The hole is now being cleaned by a new method. Two hundred barrels of pulverized sand were removed from the first 400 feet of shothole indicating a new diameter of about 20 inches. The capacity of the well is unknown but was estimated by spectators at 100 to 350 bbls. daily.

Development is now being planned by a major company from the bottom of the shaft 350 feet deep, comprising 50,000 feet of exposed pay sand. The development will cost around $400 per acre. Drilling from a shaft, Mr. Ranney adds, is less costly than from outcrop. Patents are pending on processes and methods involved, 30 patents being required. All the work is under Mr. Ranney's personal direction.

Oklahoma City Chapter A.P.I. Program

The program for the meeting of the Oklahoma City Chapter, A.P.I. Division of Production, April 18-19, at the Skirvin Hotel, follows. C. O. Rison is chairman, J. K. Ellis vice chairman, Herb Goodpaster vice chairman, and Mike Birmingham, secretary-treasurer.

Tuesday, April 18

9:00 a.m. Registration: Mike Birmingham, Indian Territory Illuminating Oil Co.

9:30 a.m. Presiding, C. O. Rison, Indian Territory Illuminating Oil Co., Oklahoma City.

9:45 a.m. Address of Welcome: Mayor of Oklahoma City.

10:00 a.m. Response: C. O. Rison, chairman.

10:05 a.m. The Oil States Compact, Gov. Leon C. Phillips.

10:40 a.m. Unitization of Oil Fields, D. R. Knowlton, Phillips Petroleum Co., Bartlesville.

11:40 a.m. Public Relations, Ray Miller, Hanlon-Buchanan, Tulsa.

2:00 p.m. Presiding, Henry Keplinger, Shell Petroleum Corp., Wichita, Kans.

2:05 p.m. Method and Application for Calculating Well Potentials, Joe Haely, Corporation Commission of Kansas.

3:00 p.m. Safety: Jack Savage, Mid-Continent Petroleum Co., Tulsa.

3:30 p.m. The Value of Threads.

4:30 p.m. Announcements: Henry Miller, Globe Oil & Refining Co., Wichita, Kans.

Wednesday, April 19

10:00 a.m. Presiding, N. M. Hutchinson, Cities Service Oil Co., Bartlesville, Okla.

10:05 a.m. "Economical Power for Artificial Lifting of Oil," W. H. Stueve, Oklahoma Gas & Electric Co., and Homer Baker, Phillips Petroleum Co.

11:00 a.m. "Bottom-Hole Pumps," S. B. Sargent, Sargent Pump Corp., Oklahoma City, Okla.

11:45 a.m. Election: N. M. Hutchinson, Cities Service Oil Co., Bartlesville, Okla.

2:00 p.m. Presiding, H. V. Mathews, Stanolind Oil & Gas Co., Pampa, Tex.

2:05 p.m. "Butane," R. E. Chambers, Skelly Oil Co., Lyman, Okla.

2:40 p.m. "Cost of Oil Field Transportation Based on Material Hauled," Bert Rice, Bert Rice Trucking Co., McPherson, Kans.

3:20 p.m. "Plug-Back Work in Completed Wells," Luke R. B. McCullar, Lane-Wells Co., Oklahoma City, Okla., and C. P. Parsons, Halliburton Oil Well Cementing Co., Duncan, Okla.

Wednesday Evening, April 19

7:00 p.m. Banquet, Silver Glade Room, Skirvin Hotel. Toastmaster, Robert S. Kerr.

Increased Gasoline Tax Rejected in California

LOS ANGELES, Calif.—The senate roads and highways committee refused approval of a bill by Senator George M. Biggar proposing an increase of 1 cent a gallon on the gasoline tax in California.

Representatives of automobile clubs opposed the bill on the grounds that motorists already bear a disproportionate share of taxes.

President Dawes of Pure Looks for Improvement

Henry M. Dawes, president of Pure Oil Co., told stockholders at their annual meeting in Columbus, Ohio, that operating results for the first quarter were disappointing, but that prospects for material improvement during the rest of the year are very good as indicated by the present statistical position of the industry and the current demand for oil products.

Mr. Dawes also announced that operating economies from the recently completed three-year modernization plan of the company's refineries have "exceeded the company's expectations, and the year 1939 will be the first calendar year in which the full benefits of the program will be realized."

"Illinois production, aside from the small stripper wells in the areas which have been producing for 25 or 30 years, is about 160,000 bbls. daily. As the consumptive requirements of the state are very much larger than that, the movement for curtailment is meeting with considerable opposition. Total United States crude oil production is approximately 3,300,000 bbls. a day, and the amount produced in Illinois is consequently not a great factor in the bigger picture. It is, however, a new field, and whatever it produces must find its way into the markets which had formely been supplied from other sections.

"The Pure Oil Co. has for many months maintained a production in Illinois of between 22,000 and 25,000 bbls. a day. If we had developed our lease holdings on a comparable basis with some other Illinois pools, it might at the present moment have a very much larger production, but it would have been in excess of market demands, and the cost would have been very much greater. This systematic and orderly development of the property will greatly increase the earnings which will be derived from it over the years."

Charles S. Cheston of Whitemarsh, Pa., was elected a director to succeed N. H. Weber of Chicago.

Buffalo Oil Co. Purchases Western K.M.A. Tract

WICHITA FALLS, Tex.—Buffalo Oil Co. of Dallas completed negotiations April 9 for the $700,000 cash purchase of a 250-acre oil tract in western K.M.A. from Consolidated Oil Co. of Wichita Falls, it was announced by Col. W. T. Knight, president of Consolidated. The tract is part of Consolidated's 516 acres in the W. H. Spillers Survey and includes nine producing wells.

THE MARKETS*

CRUDE OIL: *Markets have been steady since the first of the month. The extension of pipe line proration in Texas owing to the increase in crude oil output under a proration order is considered a disturbing development. Conditions in Illinois and California also continue unsatisfactory.*

REFINERY: *Reductions in gasoline stocks have improved markets for that product at several points. Gasoline cargo market at Gulf Coast strong. Mid-Continent natural gasolines stronger. Good movement of heavy fuels at firm prices. Heating oils weak.*

TANK-WAGON AND POSTED DEALER: *No important price changes. Retail gasoline sales have shown important gains since April.*

FINANCIAL: *Oil stocks drop to new lows for the year. Average of 30 representative stocks for week ending April 8: High, 25.72; low, 23.09; close, 23.15. Week ending April 1: High, 26.77; low, 24.52; close 25.07.*

**Additional information in market section.*

National Supply Company Executive Changes

John A. Geismar, new president

The National Supply Co. announces that on April 5, 1939, John M. Wilson became chairman of the board of directors; John A. Geismar, president; A. E. Walker, vice president, and R. W. Eller, secretary.

A general view of Gulf's U.O.P. selective polymerization plant, showing the reactors on the left, the fractionating equipment in the center, and the caustic washing equipment, etc., on the right

New Gulf Polymerization Unit in Port Arthur Texas Plant

By ERNEST COTTON
Gulf Oil Corp.

In April of 1938 the Gulf Oil Corp. put in operation at its Port Arthur, Tex., refinery a U.O.P. selective polymerization plant for the manufacture of polymerized olefins for subsequent hydrogenation to commercial isooctane. This was the first U.O.P. selective plant put in operation in the United States. This plant was designed by the Universal Oil Products Co. and was erected by the Lummus Co.

The plant was designed for a daily capacity of 1,862 bbls. of butane-butene fraction. This fraction, containing 1 to 2 per cent of propane-propene and free of pentanes, is separated from cracking still gases in an independent fractionating and collecting system.

The butane-butene fraction from this collecting system is successively washed with water and caustic soda, in equipment located at the plant site, for the removal of undesirable nitrogen and sulfur compounds. The washed material is stored in a Hortonsphere under a pressure of approximately 50 pounds per square inch gauge. This storage acts as a surge tank between the collecting system and the polymerization plant feed pump.

The washed material from this storage, containing 15 to 16 per cent isobutene and 31 to 32 per cent normal butene, is mixed with sufficient unreacted butane tail gases to make a combined polymerization charge containing 8 to 10 per cent isobutene. This combined charge is pumped by a steam engine driven duplex plunger pump, operating at a discharge pressure of 650 to 750 pounds per square inch, through a steam preheater into the top of the first reactor. The material flows downward through three reactors in series and then through a pressure reducing valve to the debutanizing and fractionating equipment. The unreacted butanes are separated from the polymer in a debutanizer and the polymer is fractionated into dimer or commercial isooctene and trimer or polymer bottoms in a second tower. A part of the unreacted butene is used for mixing with the charge for control of the isobutene concentration.

Catalyst Chambers

Exchange type reactors are used. These consist of three vertical units. The catalyst is placed in the tubes and butane-butylene is passed over the catalyst.

The shell sides of the three reactors are connected in parallel to a temperature control system employing water as the cooling medium. The charge to the reactors is brought to the reaction temperature by the heat liberated by the polymerization reaction.

It has been found in operation that the temperature is an important factor governing the octane number of the finished hydrogenated dimer, low temperatures producing high octane, and vice versa. The temperature has been varied from 260° F. to 340° F. and finished hydrogenated dimer of from 93 to 97 octane number produced.

The yield of polymer depends upon the type of dimer for which the plant is operated. The conversion of isobutene to polymer varies from 120 per cent to 180 per cent by volume, depending upon the octane number product for which the plant is being operated. The conversion naturally is less for the high octane product.

The polymer and the unreacted butane from the third reactor is separated in a debutanizing tower, which operates at 60 pounds per square inch. This tower is 5½ feet in diameter and contains 15 bubble trays. Heat is supplied to the bottom of the tower by means of a vertical steam-heated reboiler. Open stripping steam is used in

the bottom of the tower and liquid butane reflux on the top.

The reacted butane from the top of the debutanizer, containing only a trace of isobutane and 20 to 30 per cent normal butene, passes through a tubular condenser into a water separating drum. A centrifugal pump taking suction on this drum discharges a part of the material to the tower as reflux and the remainder through an aftercooler. From the aftercooler the amount needed for mixing with the charge for isobutene concentration control goes to a water settler and the remainder goes to storage to be used for blending with regular gasoline. The material from the water settler mixes with the charge in the line going to the charge pump.

Atmospheric Pressure

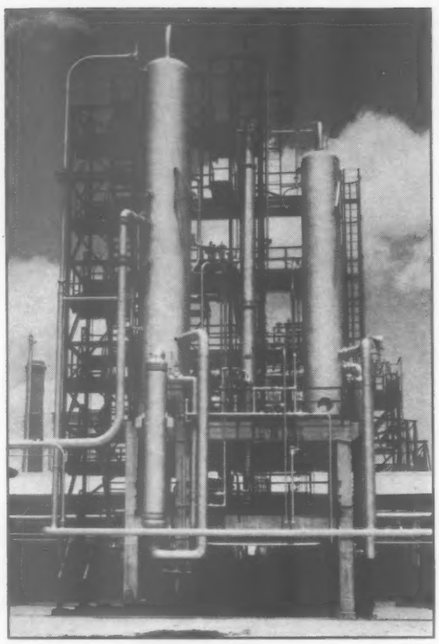
The polymer from the bottom of the debutanizer flows to the fractionating tower, which operates at atmospheric pressure. This tower is 4 feet in diameter and has 10 bubble trays. Heat is supplied to the bottom of the tower with a vertical steam-heated reboiler. Open stripping steam is used in the bottom of the tower and liquid reflux used on top.

The dimer from the top of the fractionating tower passes through a tubular condenser to a water separating drum. A centrifugal pump taking suction on this drum discharges a part of the material to the tower as reflux and the remainder to storage. This material is hydrogenated in another unit. The finished hydrogenated dimer is either sold as such or blended with aviation stock for the production of high octane aviation fuel.

The trimer is pumped from the bottom of the tower through a cooler to storage. This material is added to the regular plant production of acid-treated gasoline before it is rerun. The fraction boiling within the gasoline range is taken with the gasoline on the rerun still, the remainder going to cracking still stock.

There is no provision made for reactivating the catalyst since it has a very long life in this type of polymerization. The catalyst has been changed in only one of the reactors. This was done March 15 after it had produced 600 gallons of polymer per pound.

The unit operates continuously and has been down only twice for general inspections, since it was started. There have been no indications of corrosion on either of the inspections.



In the debutanizer shown on the left, the unreacted butane is separated from the polymer. The polymer is fractionated, in the tower shown on right, into dimer and trimer

EASTERN A.P.I.

(Continued from Page 17)

capable of determining if structures discovered otherwise are oil-bearing and offers promise of distinguishing between oil and gas fields; it is less costly, rapid and demands simple field technique; it is capable of discovering fault lines.

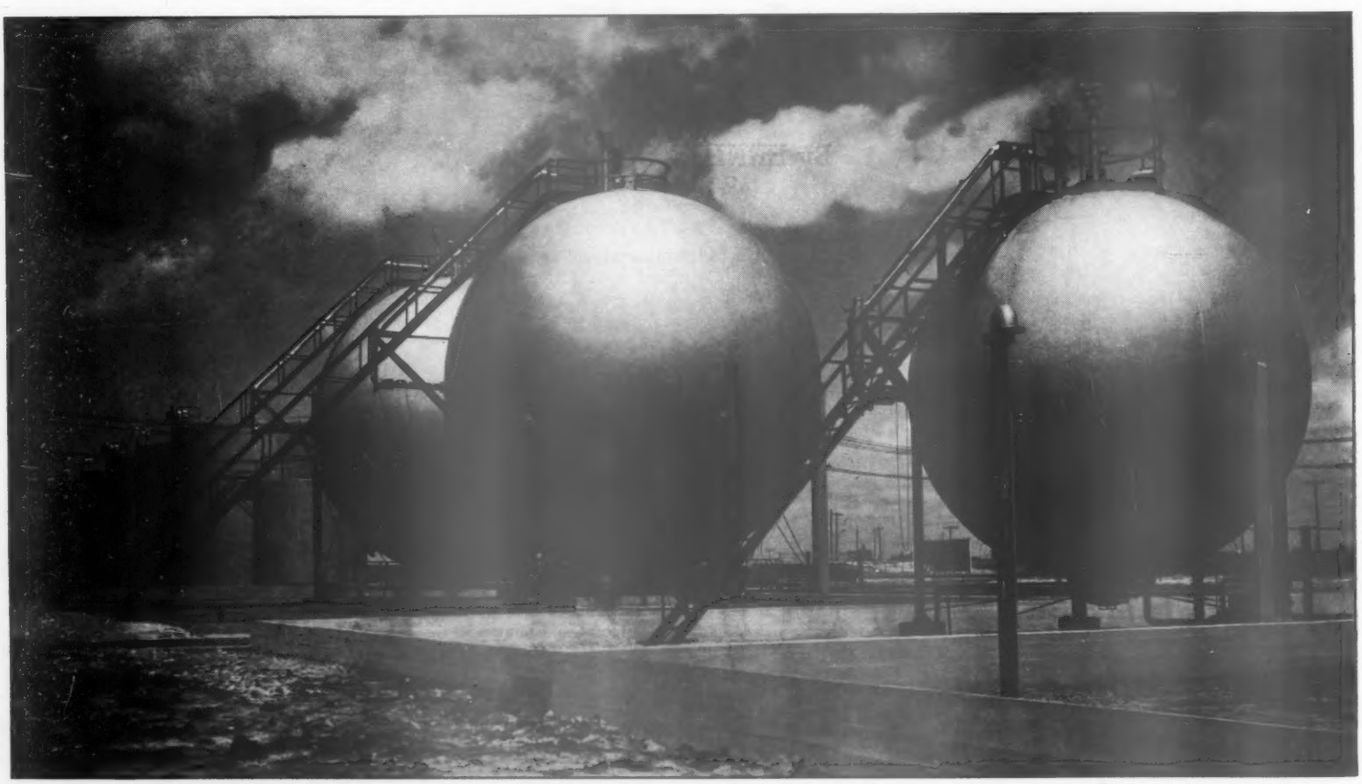
A. J. Teplitz, of Gulf Research & Development Co., Pittsburgh, questioned the method on several counts, citing the great possibility of error in interpretation of results and the waxy hydrocarbon content of some soils.

D. T. Ring, Preston Oil Co., Columbus, Ohio, was elected chairman to succeed Christy Payne, Jr., Peoples Natural Gas Co., Pittsburgh, who became chairman of the advisory committee. Newly elected vice chairmen are R. W. McIlvain, Jr., Pure Oil Co., Olney, Ill., and John A. Thompson, Belmont Quadrangle Drilling Corp., Bradford, Pa. J. J. Schmidt, East Ohio Gas Co., Cleveland; T. H. Myers, Carnegie Natural Gas Co., Pittsburgh and O. W. Van Petten, Columbian Carbon Co., Charleston, W. Va. I. W. Hartman, Gordon Oil Co., Mount Pleasant, Mich., was elected secretary-treasurer.

Additions to the advisory committee included A. H. Bell, Illinois State Geological Survey, Urbana, Ill.; F. A. Benckert, Peoples Natural Gas Co., Pittsburgh; W. L. McCloy, Ohio Fuel Gas Co.; E. V. O'Rourke, Ohio State University, and D. T. Ring, Preston Oil Co., all of Columbus, Ohio.

Mid-Continent Plant Strike Still Unchanged

No new moves have been announced which might lead to a settlement of the strike by the Oil Workers Union against Mid-Continent Petroleum Corp. The Oklahoma Legislature appropriated an additional $15,000 for the National Guard which brings the expense of martial law to $65,000. A review of events connected with the strike is being presented to the Tulsa County grand jury.



These Hortonspheres are used for storing charging stock for the plant and the unreacted butane tail gases from it

Oil-World Exposition Is Busy Scene on Eve of Opening

By NEIL WILLIAMS

HOUSTON, Tex., Apr. 10.—With the opening date less than two weeks off, final arrangements for the second biennial Oil-World Exposition, April 24-29, are being rushed to completion. Already, the municipal Coliseum, where the exposition will be held, is a scene of activity with moving in and setting up of booths and displays and decorations well under way.

Advance reservations of oil men from out of Houston indicate attendance at this show will far exceed that of the last show. Reservations and inquiries have come from all parts of the country and from many foreign countries. The foreign delegation this year will be unusually large.

The final program for the exposition and its various auxiliary conferences and group meetings was announced by exposition officials the past week. The program, one of the most complete ever arranged for such an event, will provide a week crowded with oil men's activities.

Group meetings and conferences will occupy a more important part of the exposition this year than before. These will continue throughout the entire week of the exposition. All branches of the industry, including production, refinery, pipe line, transportation and marketing will be represented with technical and semi-technical papers and discussions covering a wide range of subjects of timely importance to the respective branches of the industry.

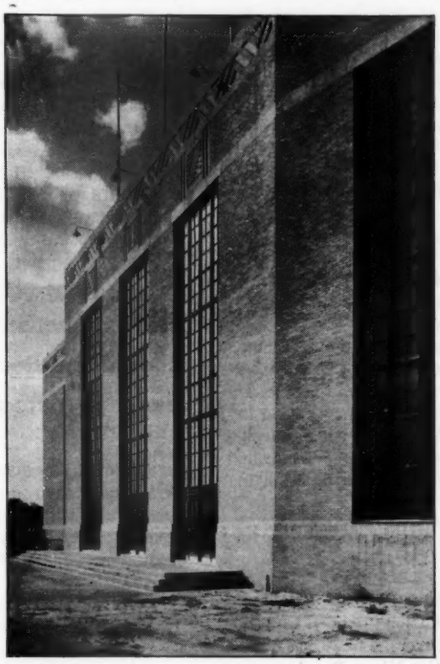
Group Meetings

According to the schedule, group meetings of the different branches will be held simultaneously, each appealing to these oil men particularly interested in the respective phases of operation. The refinery meetings have been divided into sections, with one day to be devoted to each section. These will include the chemists' section, April 25; instrument section, April 26; heavy equipment section, April 27, and processing section, April 28.

Formal opening of the exposition is scheduled for 2 o'clock Monday afternoon, April 24. A special program has been prepared for this, including talks by Jesse H. Jones, Houston's first citizen and chairman of the Reconstruction Finance Corp., and Oscar F. Holcombe, mayor of Houston, who will welcome the visitors. Ceremonies will include the introduction of officials and others who have been particularly active in arrangements for the show. Special music also will be provided.

One of the most important meetings of the entire exposition, arranged by the Oil Equipment Export Committee, is scheduled for the opening afternoon. An elaborate program of talks and discussions on various phases and problems of shipping and handling export business has been prepared. Special papers include "Crating and Papers Necessary for Foreign Shipments," "Proper Insurance on Foreign Shipments," "General Trend of Drilling Equipment in Foreign Fields," "Export Sales From the West Coast," "Transportation Problems in Venezuela," "Transportation Problems in Colombia," "Foreign Exchange," "Barter and Its Effect on Foreign Trade," "Methods of Promoting Foreign Sales," "Aviation and Its Place in the Oil Industry," "Petroleum Development in Brazil," "Petroleum Outlook in Rumania," and "The Far East."

Tuesday's program will include meetings for the chemists division of the refinery group, drilling and production group, and pipe line group. The former will have as its subject laboratory equipment and practices. "Prime Movers in Oil Field Operations" will be discussed by the drilling and production groups. The morning session of the pipe line group will take up reading of papers on pipe line equipment maintenance, with the afternoon session being devoted to corrosion and cathodic protection. The latter program has been arranged by the Mid-Continent Cathodic Protection Association. A banquet will be held Tuesday evening for the pipe line group.



Entrance to Oil-World Exposition

Foreign Visitors

Meetings scheduled Wednesday are those of the instrument division of the refinery group, drilling and production group, and motor transportation group. In addition there will be a banquet for visitors from foreign countries Wednesday evening. The drilling and production program Wednesday afternoon will be devoted to drilling practices, and in the evening technical papers prepared by students of various university and college engineering schools will be presented in contest for prizes totalling $300.

On Thursday morning the drilling and production group will take up controlled directional drilling, and in the afternoon well completion and production practices. The heavy equipment division of the refinery group, which also meets Thursday, will hear special papers on "Steam Turbines in Refineries and Natural Gasoline Plants," "Applications of Centrifugal Pumps to Refinery Service," and "Recent Developments in Copper Alloy Condenser Tubes." Also scheduled for Thursday is a luncheon and program exclusive for drilling contractors at noon, and a barbecue in the evening for the safety group, who will be guests of Texas Co.

Safety Sessions

The safety group will hold all its sessions on Friday. An unusually complete program on safety work is scheduled, made up both of papers and demonstrations. Some of the leading authorities on safety work direction will be on the program. Demonstrations under the direction of the safety section of the United States Bureau of Mines will be special attractions. The processing division of the refinery group also will hold an all-day session with a program covering various phases of refinery practices and developments in equipment.

With the addition of more than 90,000 feet of floor space provided by the recent completion of a two-story annex to the Coliseum and by extra outside space which has been arranged, the exposition this year will be substantially larger than previously. All the space has been engaged, with more than 500 different exhibitors signed. Not only will the number of exhibitors be greater than in the last show but also the displays of many will be much larger, including a number of very recent developments in equipment.

Geological and geophysical exhibits and demonstrations will be among the special features of the exposition. Various types of geophysical instruments in actual operation will be shown.

To break the intensive schedule of its many group meetings, conferences and other programs, exposition officials have taken care to provide numerous recreational events, including golfing and skeet shooting.

Nine Tide Water Directors To Be Elected

Tide Water Associated Oil Co. has issued its notice for the annual meeting May 9, 1939, in New York. Eight directors are to be elected and the proxy committee intends to vote for Alden Anderson, George Armsby, L. F. Bayer, Samuel A. Bishop, B. I. Graves, L. D. Jurs, Noel Robinson and Edward H. Salrin, whose terms expire. A ninth director is to be elected to fill the unexpired term of the late Henry W. deForest and the proxy committee intends to vote for Johnston deForest, his nephew.

INTERNATIONAL

Shell Wins From Eastern States On Mexican Oil

The United States Circuit Court of Appeals in New York, April 10, handed down a decision in favor of the Shell group in the Mexican oil controversy. The court dissolved a temporary injunction entered January 30 by Judge Robert P. Patterson in United States District Court in New York.

The injunction had forbidden Asiatic Petroleum Corp. and Anglo-Mexican Petroleum Corp., Shell companies, and their president, Harold Wilkinson, from interfering with the performance of the Eastern States Petroleum Corp. contract for sale abroad of products of Mexican crude, but permitted the Shell group to bring suit to recover Mexican oil or damages for its seizure.

Eastern States argued that its oil came from government-owned wells not expropriated from Mexican Eagle, but the court held it "doubtful whether such a position is tenable because of the indiscriminate commingling of all of the oil from all of the wells in the field."

U. S. Oil Exports to Great Britain Are Nearly Doubled

Petroleum exports from the United States to Great Britain were nearly doubled in the first two months of this year compared to the same period in 1938, according to reports of the Board of Trade in London. Total British petroleum receipts from the United States during January and February were about 3,333,000 bbls., compared to approximately 1,711,000 bbls. in 1938. The increase in petroleum demand from the United States was restricted to motor fuel, lubricating oil and residual fuel oil. Motor fuel receipts from the United States in the two months jumped to 689,800 bbls. against 452,030 bbls. in 1938.

Several other suppliers of Great Britain's petroleum requirements shipped greater volumes during the first two months of the year, but a complete cessation of receipts from Mexico and curtailed buying from a few other countries caused a decline in total receipts. During the first two months of this year Great Britain received about 14,661,000 bbls. of petroleum from all sources, compared to 14,876,700 bbls. for the same period in 1938. Reductions were suffered by the Netherlands West Indies, Iraq, Russia and Peru in addition to Mexico. Gains were registered by Iran, Venezuela, Rumania, Netherlands East Indies and Trinidad in addition to the United States.

Trinidad Output Shows Increase Over Year Ago

Crude-oil production in Trinidad, B.W.I., totaled 1,499,197 bbls. in February, a daily average of 53,543 bbls, according to the Mines Department. The February output represented an increase of nearly 240 bbls. in the daily average over January when production totaled 1,652,412 bbls., or 53,304 bbls. daily. In February 1938 Trinidad produced 1,304,819 bbls. For the first two months of the current year Trinidad production totaled 3,151,609 bbls., compared to 2,682,840 bbls. in 1938, indicating to what extent present output is running ahead of last year during which petroleum yield set a new high record for the island.

Italy's Seizure of Albania Does Not Change Oil Status

The latest foray of the European dictators, Italy's conquest of Albania, had no practical bearing upon the petroleum supply alignment of the major countries. Although Albania produced nearly 490,000 bbls. of low-gravity oil last year practically 100 per cent was shipped direct to Italy. The Italian National Railway owned the only productive area in Albania, moving the oil by pipe line for a short distance from the field at Berat to Valona, where it is moved by tankers to Italy.

Being of inferior quality the Albanian crude oil is used almost exclusively in the hydrogenation plants built in Italy during the past four or five years at Bari and Leghorn. Another concession in Albania was controlled by a French group but it had not been successful in developing production of any considerable proportion.

Italy's occupation of Albania and Germany's acquisition of Czechoslovakia and Austria have netted the two dictator countries in Central Europe only about 1,000,000 bbls. of petroleum production per year. Considering that production in the Greater Reich and native to Italy totals only a little more than 5,000,000 bbls. per year with nearly 4,100,000 bbls. of that total in Germany it is evident that both remain deficient in indigenous petroleum reserves. The normal peacetime requirements of the two countries are in the vicinity of 40,000,000 bbls. annually.

American Rotary Ordered for Test in Equatorial Africa

An American-made rotary rig has been ordered for deeper exploratory drilling in French Equatorial Africa, according to information reaching the U. S. Department of Commerce through the American consular service in Paris. Two tests have been drilled on the so-called Madiela dome. One of the tests was discontinued at 450 meters and the second reached 700 meters after having penetrated approximately 100 meters of salt. A third test, which was located some distance west of the first two holes, reached 900 meters. The tests drilled so far have indicated that sedimentary beds are thicker than originally estimated and that deeper drilling must be carried out to fully explore the petroleum possibilities. Prospecting in French Equatorial Africa in the region of Gabon was first given serious study in 1928 when a geological party was assigned to the region between Pointe-Noire to the south and Port-Contil to the north, over an average width of 150 kilometers. The French National Office of Liquid Fuels and the Compagnie Francaise des Petroles became interested in the prospects as a result of the original investigation and have combined in conducting subsequent search.

Iran Production At All-Time Record; Likely to Increase

Iran's crude-oil production in 1938 totaled 10,195,371 tons, according to figures supplied by Anglo-Iranian Oil Co., Ltd. On a basis of 7.515 bbls. per ton, the average for Iran, the production totaled 83,618,213 bbls., an increase of 7,207,234 bbls. over the 1937 output. To round out the year, December production totaled 862,370 tons, or approximately 6,228,210 bbls., one of the lowest monthly figures reported for the year. In contrast to December results, November 1938 production totaled 6,364,100 bbls., or 135,890 bbls. more than in the final month of the year.

The 1938 total production of 83,618,213 bbls. was slightly less impressive than indicated at the end of 9 or 10 months, but it set a new all-time record for Iran. The effect of developing at least one new field and possibly another to the shipping stage probably will reveal itself in the early or middle 1939 production reports from that country.

Two New Wildcats Will Be Drilled Soon in Sumatra

Two additional wildcat tests are to be drilled in central Sumatra by Netherlands Pacific Petroleum Co., subsidiary of Standard Oil Co. of California in which Texas Co. now holds a half interest. The two tests are scheduled to start this month. One is to be on the upper Koeboe River and the other between the Siak and Rokan rivers. Netherlands Pacific Petroleum Co. abandoned a deep failure on its Sumatra property the middle of last year. The Netherlands company obtained the property to be tested in 1936 totaling approximately 1,482,000 acres.

The company obtained delivery near the end of last year on two houseboats constructed for its account at Tandjong Priok, Java, which contain accommodations for the geological personnel and laborers. The Rokan district in which the Netherlands Pacific company's concession is located abounds in rivers and marshes.

North of the Netherlands Pacific's holdings, Bataafsche Petroleum Maatschappij completed three new wells late in 1938 between Pangkalan Brandan and Pangkalan Soesoe in northeastern Sumatra.

Role of Catalysts Is Discussed by A.C.S.

By H. STANLEY NORMAN

BALTIMORE, Md., Apr. 11.—The progress made by petroleum chemists in tearing apart and rebuilding hydrocarbon molecules to the end that more and improved motor fuel is being produced was reviewed here last week at a symposium on the role of catalysis in petroleum chemistry consuming two days of the American Chemical Society's ninety-seventh meeting.

There were 29 papers presented on catalytic methods and theories of dealing with petroleum hydrocarbons. In addition there were five papers at another joint symposium with the Division of Industrial and Engineering Chemistry on thermal insulation. There were 850 chemists present, indicating the interest in catalytic refining.

Per K. Frolich, Standard Oil Development Co. chemist, Bayway, N. J., laboratory, is chairman of the A.C.S. Petroleum Division and his term of office continues until September. C. R. Wagner, chief chemist of Pure Oil Co., is secretary.

At the divisional dinner, V. N. Ipatieff, Universal Oil Products Co. chemist, was the guest of honor and addressed the group on "The History of Catalysis in Petroleum Chemistry."

The program was arranged with an effort to give chronological order to discussion of catalytic refining. Treatment was given to alkylation, catalytic cracking and reforming, dehydrogenation, polymerization, isomerization and aromatization. All new processes have the common objective of increasing the production of branched-chain hydrocarbons which are arranged like the fins on a fish and under combustion conditions of an engine oxidize in a streamlined manner.

In discussing "Catalysis and Polymerization," Robert E. Burk, Western Reserve University chemistry professor, discussed what substances catalyze polymerization.

Aviation in particular will benefit from discoveries and advances in the alkylation of hydrocarbons, Doctors Gustav Egloff and J. C. Morrell, Universal Oil Products Co. chemists, told the Baltimore audience in discussing this topic.

Production of a saturated material, essentially isoparaffinic and possessing a high octane number by the sulfuric acid catalyzed addition of C_4 olefins to isobutane in a single stage without recourse to polymerization or hydrogenation was described in a paper by S. F. Birch, A. E. Dunstan, F. A. Fidler, F. B. Pim and T. Tait of Anglo-Iranian Oil Co., Ltd., research department.

Alkylation at temperatures in the vicinity of 400° F. and at pressures not far from 1,000 pounds in the presence of double compounds of alkali halides and aluminum halides as catalysts was related by F. H. Blunck and D. R. Carmody, Standard Oil Co. (Indiana), Whiting, Ind.

Isomerization has come to be regarded as a distinct process, which, in certain cases can be carried out to the exclusion of other reactions, according to presentation of a paper by C. W. Montgomery, J. H. McAteer and N. W. Franke of Gulf Research & Development Co., Pittsburgh.

In another discussion of isomerization of hydrocarbons, Dr. Egloff, V. I. Komarewsky and George Hulla, Universal Oil Products Co., presented the probability that the process will be of much importance in the production of valuable selected hydrocarbons by reactions consisting only in a change of configuration, or rearrangement of carbon and hydrogen atoms.

Production of 100-octane aviation motor fuel by high-pressure hydrogenation was described by E. V. Murphree and E. J. Gohr of Standard Oil Development Co. and C. L. Brown, Standard Oil Co. of Louisiana. Naphthas, they said, can be produced by high-pressure hydrogenation which are similar in stability and volatility to naphthas prepared by distillation of selected crudes and which possess antiknock properties superior in general to such natural naphthas.

The production of hydrogenated naphthas to augment the supply of natural fuels, they related, has been made possible by the development of new catalysts for high-pressure hydrogenation operations. These catalysts possess the property of converting petroleum oils boiling outside the naphtha range into lower boiling cyclic and branched chain compounds which impart desirable high-octane values to the naphtha product.

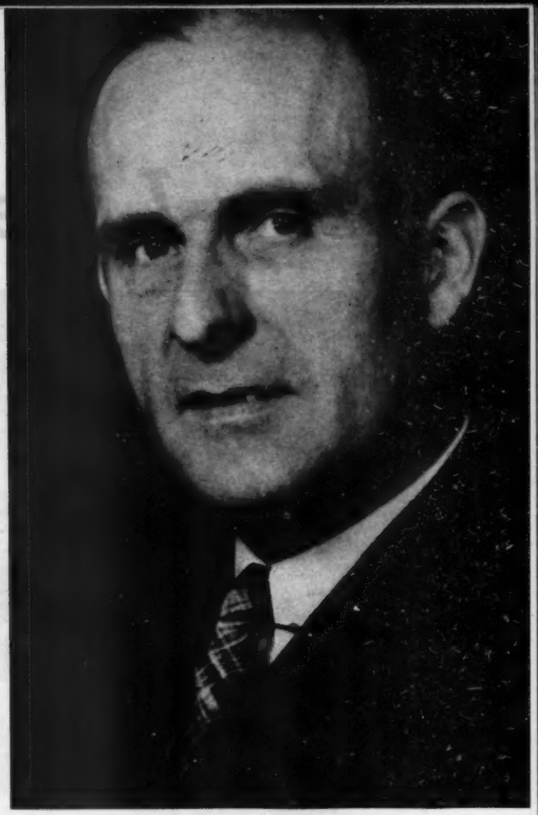
The need for specific methods of producing greater quantities of certain olefins from petroleum has led to the process of catalytic dehydrogenation of the corresponding saturated hydrocarbons. This development was described by E. C. Williams of Shell Development Co., Emeryville, Calif. The manufacture of synthetic chemical and gasoline products from lower olefins is now consuming large proportions, and in some cases, all, of the directly available olefins.

Authors' abstracts of A. C. S. papers begin on Page 40

The catalytic cracking of alophatic hydrocarbons was discussed in a paper by Doctors Egloff and Morrell in conjunction with Charles L. Thomas and Herman S. Bloch all of the Universal Oil Products laboratory.

The growing use of copper sweetening methods in treatment of gasoline has created a new problem in obtaining stability of motor fuel. An exhaustive study of this problem and a solution that received much interest from the technicians attending the meeting was presented by F. B. Downing, R. G. Clarkson and C. J. Pedersen of du Pont & Co., Wilmington, Del.

The catalytic effect of engine metals on motor oil was discussed by Mr. Downing, G. E. Holbrook, and J. H. Fuller, also of the du Pont & Co. organization. They came to the conclusion, after giving details of engine tests, that the catalytic effect of engine metals, particularly iron and copper, is thought responsible for a major part of the deterioration of motor oils in service. They suggest the serious consideration of investigators in the study of motor oil additives after relating favorable results obtained by addition of one-half of 1 per cent of a phosphorous material.



PER K. FROLICH
Chairman, Petroleum Division

Catalytic hydration of olefins, ethylene and propylene, particularly on the use of sulfuric acid as the catalyst was described by W. H. Shiffler, M. M. Holm, and L. F. Brooke, of Standard Oil Co. of California. A method of testing for gum formation in cracked gasolines and the results observed were presented by D. L. Yarbroff and E. L. Walters of Shell Development Co., Emeryville, Calif. A similar study on the formation and composition of Pinene gum was presented by Bernard Berger and R. W. Bost of the University of North Carolina chemical laboratory.

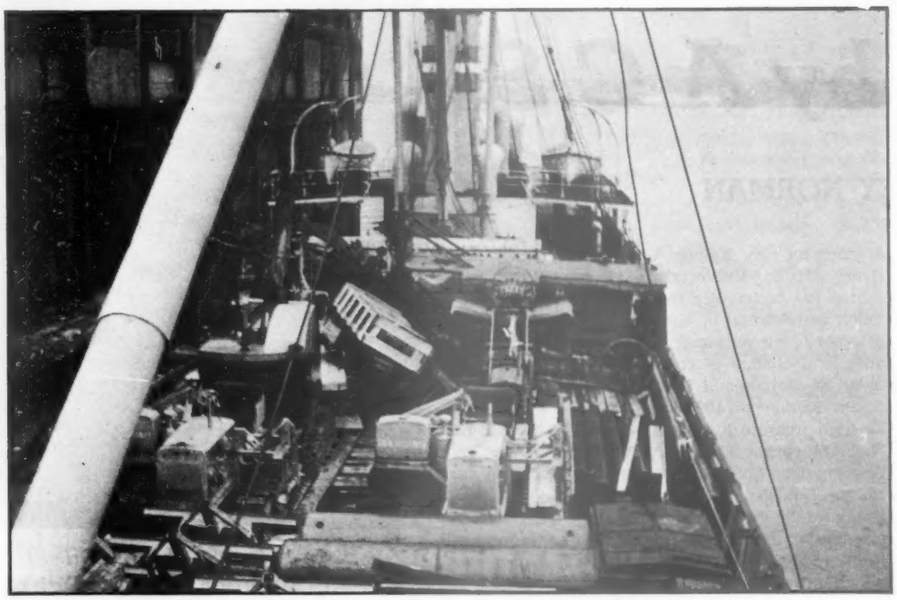
There were several papers by students and professors from the University of Texas and there was presented a rapid method for the determination of aromatic hydrocarbons by Aristid V. Grosse and Richard Waskher, Universal Oil Products Co.

"Composition of Lubricating Oil" was the title of a paper presented by K. A. Varteressian, of Esso Laboratories; M. R. Fenske, Pennsylvania State College, and H. S. Smith, Texas Co.

A new viscometer, known as a microviscometer, for the sampling of oil has been developed at the Mellon Institute of Industrial Research and its operation was described by John R. Bowman of that laboratory. Beveridge J. Mair and Charles B. Willingham presented their findings in a study of the efficiency of a rotary distillation column. The authors are research associates of the National Bureau of Standards, representing the American Petroleum Institute which contributed financial assistance to the work.

W. B. Kay, of Standard Oil Co. (Indiana), Whiting, Ind., described work in the search for accurate pressure-volume-temperature-composition data as an aid in the study of the phase equilibrium composition relations in the critical region of hydrocarbon mixtures. Mr. Bowman and an associate, William E. Hanson, of the Mellon Institute, gave a review on the determination of the molecular weights of oils.

Pipe Line Activity



MOTORSHIP CARRIES CONTRACTORS' EQUIPMENT TO SOUTH AMERICA

For laying the 100-mile pipe line from Gunta to Officina, Venezuela, for Mene Grande Oil Co., the contractors, Williams Brothers Corp., Tulsa, and S. D. Bechtel, San Francisco, had 25 carloads of equipment for the job shipped by rail to Baltimore where it was loaded on the Norwegian 1,100-ton motor ship Herma.

The shipment also included the equipment for H. C. Price Co., Bartlesville, Okla., which has the welding contract. Before loading the equipment, 25 carloads of 16-inch pipe were put in the bottom of the ship's hold. This left insufficient space for all of the equipment. In the hold were placed boom-tractors, tow tractors, backfillers, welding machines, welding-rods, trucks, complete camp equipment and groceries for 85 for two months.

The photograph shows the equipment loaded on deck. Trucks in the shipment included 35 heavy-duty trucks and 10 pick-ups. The ship sailed March 22 and arrived at Gunta, Venezuela, March 30. Laying of pipe started April 3. From the United States 85 men have been sent to the job; all of these arrived before or on the day the Herma made port. It is expected that 200 or more Venezuelans will be employed. Pipe is to be cleaned by cleaning machine on arrival at Gunta before painting and wrapping. The line is to be buried under 2 feet of cover. It is anticipated it will be completed about September 1.

Standard of Louisiana Lets Contract to Williams Bros.

Standard Oil Co. of Louisiana has awarded to Williams Brothers Corp. the contract for taking up, cleaning, classifying, reconditioning and relaying of 40 miles of 8-inch pipe between Buckner, Ark., and Hattiesville, La.

The lines will extend from the Haynesville station of the Standard trunk line system, and will give the Village and Buckner fields their first pipe line outlets. Crude has been moving from these fields by truck. The Magnolia field has outlet to the Arkana Transit Corp. trunk line which extends to Shreveport.

Pipe Line Divorcement Bill Hearings to Be Brief

WASHINGTON, D. C., Apr. 10.—Oil industry witnesses will be heard only briefly on divorcement of pipe lines as provided in the commodities clause of the Wheeler-Truman omnibus transportation bill, under plans announced by Senator Bertram K. Wheeler of Montana, chairman of the senate committee on interstate commerce.

A great many oil witnesses have asked to be heard and the chairman announced he will hear some probably this week, but he does not desire a long parade of witnesses and hopes the entire presentation can be made by a few. Hearings were held last week and there was considerable opposition to the proposal to give the Interstate Commerce Commission regulatory powers over all forms of transportation equal to that it now exercises over railroads, but the commodities clause was not directly discussed.

Senator Wheeler indicated he did not draft the commodities clause with the oil industry particularly in mind and if the clause is so worded as to dismember integrated oil companies the subject might better be considered by Congress in separate legislation rather than as a part of the revision of transportation laws. As introduced, the bill would prevent a pipe line or any other common carrier except an air line from carrying a commodity owned by itself, by an affiliated company, or by a persor or corporation owning a controlling interest in the carrier.

The subject is not likely to be dropped without much discussion since agitation for pipe line divorcement has been strong in certain quarters for several years and is favored by a number of congressmen.

Southern Yoakum Line Ready in Three Weeks

Officials of Tyler Pipe Line Co., which is constructing an outlet from Aloco Oil Co. wells in southern Yoakum County, Texas, to Atlantic Pipe Line Co. trunk line at Hobbs, N. M., expect to have the carrier in operation within three weeks.

Pipe Lines Across Canal Are Ordered Buried

SHREVEPORT, La.—Oil company owners of pipe lines crossing Soda Lake Canal and the main channel of Cross Bayou, for which no permits were obtained, will be requested to remove them because of obstructing the natural flowage of the stream, it was decided by Caddo Parish Levee Board.

Nearly a dozen lines, ranging from 2½- to 6-inch lines, cross the bayou and canal channels. Only one meets requirements that the lines be buried beneath the canal or bayou bottom. The situation was brought about by application of Atlas Pipe Line Co. to build a line across the canal, subject to approval by the state board of engineers.

Humble Reported Planning Houston Field Station

HOUSTON, Tex.—Humble Oil & Refining Co. has filed long-term surface leases on a portion of the H. H. Dailey Estate tract in the northeast corner of the J. G. Thompson Survey on which a pump station is to be erected to serve the Navarro Crossing field. It is reported the company will build a 55,000-bbl. tank.

Refinery Projects

Barber Asphalt Corp. to Add Copper Sweeting Unit

BARBER, N. J.—Barber Asphalt Corp. announces the completion of arrangements through Process Management Co., Inc., whereby a 3,000-bbl. per day capacity Perco copper sweetening unit will be installed at its Barber, N. J., refinery under a license agreement recently completed with Perco, Inc., Bartlesville, Okla. The unit will be the so-called liquid process design and construction will begin as soon as the equipment is on the ground. Barber Asphalt Corp. processes Venezuelan and domestic crudes.

Skimming Plant Started At Manchester, Mont.

Construction started on a 100-bbl. plant about 6 miles northwest of the city, near Manchester, Mont. It is being built by Hayden Mann and associates, which include some trucking firms. It is understood that high-gravity crude from Kevin and Cut Bank will be used. The plant will make third-grade gasoline, tractor fuel and heating oil.

Construction Work Rushed At Brandon Refinery

BRANDON, Manitoba.—Work is being rushed on the installation of a Dubbs cracking unit at the Anglo-Canadian Oil Co. central refinery here. Dr. Sidney Born is supervising the installation. It is expected the work will be completed in time for the early summer demand.

Calgary Refinery Will Start Operations Soon

CALGARY, Alberta.—The new $1,500,000 refinery of the British American Oil Co. at East Calgary started testing operations on April 10, and is expected to be in normal operation by April 24. Two 4-inch pipe lines have been run from the Calgary terminus of the Royalite Oil Co. pipe lines from Turner Valley, a distance of about 1 mile; one line to handle crude and the other naphtha and absorption gasoline.

Franklin Creek Plant Located at Franklin

In the annual refining survey appearing in the March 30 issue of The Oil and Gas Journal it was incorrectly stated that the refinery of the Franklin Creek Refining Corp., 88 Lexington Avenue, New York, was located in California. The plant is located at Franklin, Pa. Following is the personnel of the corporation: President, Dr. Ferdinand Sonneborn; vice president, J. F. Roten; secretary, R. G. Sonneborn; treasurer, M. Pick; general superintendent, C. H. Alsberg; sales manager, C. F. Felton; chief chemist, T. G. Murphy.

Natural Gasoline

Recent Report Shows Decreased Natural Gasoline Production

The production of natural gasoline continued to decrease in February 1939, according to a report prepared by the Bureau of Mines. The daily average in February was 5,621,000 gallons compared with 5,777,000 gallons in January. The chief decreases in February occurred in Louisiana and in the Oklahoma City and Kettleman Hills fields.

Stocks at refineries and plants and terminals increased slightly, the total on hand at the end of the month being 197,736,000 gallons, compared with 195,174,000 gallons (revised figure) on hand January 31, 1939. A material decline in refinery stocks in February was outweighed by gains in plant stocks.

Shipments to jobbers and retailers decreased from 9,240,000 gallons in January to 8,904,000 gallons in February, and exports from 17,136,000 gallons to 6,384,000 gallons, the lowest figure since July 1937.

The average vapor pressure increased for shipments to refineries and jobbers but decreased for refinery-owned bulk plants and exports. The weighted average for all shipments was 20.9 pounds, compared with 20.2 pounds in January 1939, and 20.0 pounds in February 1938.

PRODUCTION AND STOCKS OF NATURAL GASOLINE

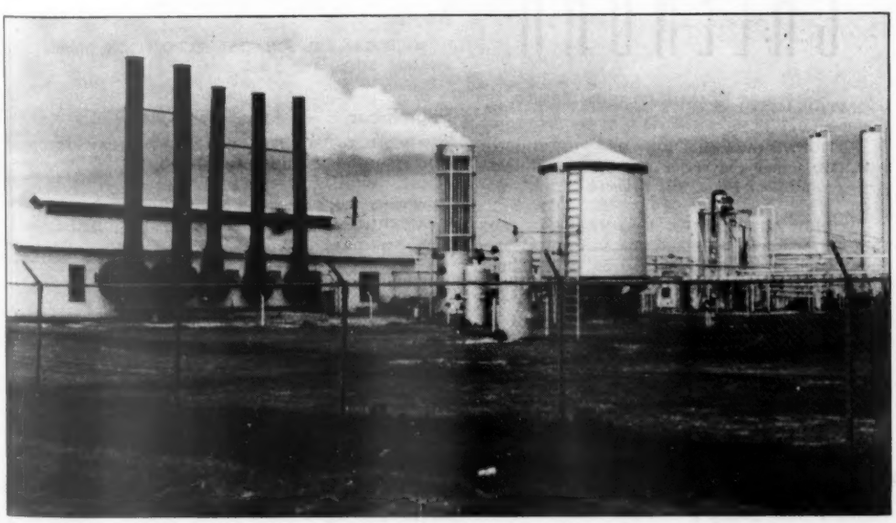
(Thousands of gallons)

	Feb. 1939	Jan. 1939	Jan.-Feb. 1939	Jan.-Feb. 1938	At refineries
East Coast	.....	.....	.....	.....	2,898
Appalachian	6,791	7,490	14,281	13,677	188
Illinois, Michigan, Kentucky	1,182	1,358	2,540	2,098	2,184
Oklahoma	33,458	38,639	72,097	80,644	1,218
Oklahoma City	8,138	9,554	17,692	25,116	.....
Osage County	3,561	4,340	7,901	7,918	.....
Seminole	8,898	10,039	18,937	20,556	.....
Rest of state	12,861	14,706	27,567	27,054	.....
Kansas	4,887	5,454	10,341	9,617	42
Texas	48,364	55,512	103,876	100,889	5,040
Gulf	4,705	5,052	9,757	6,232	3,990
East Texas	12,907	14,424	27,331	28,211	.....
Panhandle	17,514	20,750	38,264	39,676	.....
North Texas	1,943	2,220	4,163	3,995	.....
West Central	5,083	5,916	10,999	11,280	.....
Rest of state	6,212	7,150	13,362	11,495	.....
Louisiana	6,388	7,504	13,892	14,853	42
Arkansas	1,906	2,108	4,014	3,509	84
Rocky Mountain	6,204	6,994	13,198	11,861	672
California	48,194	54,029	102,223	108,302	92,022
Huntington Beach	2,755	3,143	5,898	6,899	.....
Kettleman Hills	13,522	16,253	29,775	29,969	.....
Long Beach	6,532	7,287	13,819	13,380	.....
Santa Fe Springs	4,658	5,078	9,736	10,582	.....
Ventura Avenue	4,768	5,139	9,907	10,001	.....
Rest of state	15,959	17,129	33,088	37,471	.....
Total	157,374	179,088	336,462	345,450	104,370
Daily average	5,621	5,777	5,703	5,855	.....
Total (thousands of barrels)	3,747	4,264	8,011	8,225	2,485
Daily average	134	138	136	139	.....

RECEIPTS AND DELIVERIES OF NATURAL GASOLINE

(Thousands of gallons)

	134	138	136	139	.....
	Deliveries		Receipts		
	To refineries	To refinery-owned bulk plants	To jobbers and retailers	Exports	At refineries	At refinery-owned bulk plants	By jobbers and retailers
East Coast	.....	.....	.....	.....	1,892	.....	68
Appalachian	4,101	223	2,062	219	2,404	223	957
Indiana, Illinois, Kentucky, etc.	1,069	.....	202	.....	15,246	2,326	2,307
Oklahoma	22,652	1,493	1,903	432	14,203	50	1,217
Kansas, Missouri, etc.	3,535	90	233	.....	12,142	790	301
Texas Inland	28,673	1,749	2,263	1,366	20,431	125	2,078
Texas Gulf	5,543	.....	185	1,511			
Louisiana and Arkansas	3,185	215	1,384	.....	3,185	223	1,312
Rocky Mountain	6,069	10	117	.....	5,324	43	109
California	44,747	.....	555	2,856	44,747	.....	555
Total	119,574	3,780	8,904	6,384	119,574	3,780	8,904
Daily average	4,271	135	318	228	4,271	135	318
Total (thousands of bbls.)	2,847	90	212	152	2,847	90	212
Average vapor pressure	21.6	16.0	17.1	15.5	21.6	16.0	17.1



United Gas Pipe Line Co. gasoline plant in Agua Dulce field, Nueces County, Southwest Texas

Continental Starts New Louisiana Project

PONCA CITY.—Continental Oil Co. announced today the start of a $500,000 construction program in the Ville Platte, Louisiana, oil field which will include a gasoline plant, crude oil desalting plant, and pressure maintenance plant.

The company said the pressure maintenance plant would be similar to one it operates at Tepetate, La.

The gasoline plant, the announcement said, will have a capacity for processing 25,000,000 cu. ft. of gas and the vapors from 10,000 bbls. of crude oil a day.

Continental has 38 producing wells in the Ville Platte field.

Westoak Completes Treater

Westoak Gasoline Co., of Sayre, Okla., has completed a Perco solid copper sweetening unit at its natural gasoline plant. The unit was constructed according to the design of Perco, Inc., Bartlesville, Okla., licensor.

Natural Gas

COUDERSPORT, Pa., Apr. 10.—Three wells were completed in the New York-Pennsylvania Oriskany sand gas fields during the past week, one of them the largest so far in the new Sharon Township, Potter County, Pennsylvania, field. This well, of the Empire Producing Co. on the F. Dickerson farm, had an initial open flow of 26,000,000 cu. ft. from depth of 4,764 feet. It reached the top of the Oriskany at 4,761 feet and at 1 foot in the sand got the first pay. The rock pressure was 1,400 pounds.

Belmont Quadrangle Drilling Co. No. 2 on the R. M. Wolcott farm, about a quarter mile south of the discovery well, got a small showing of gas in the top of the sand at 5,004 feet but salt water at 5,005 feet forced plugging and abandonment of the well. The total depth was 5,007 feet with the top of the Onondaga at 4,940 feet.

The third completion was in Woodhull Township, Steuben County, New York, where New York State Natural Gas Co. got 7,400,000 cu. ft. initial production in No. 3 on the Parks farm. This well topped the Onondaga at 4,146 feet, the Oriskany at 4,176 feet, got the first sand at 4,180 feet and was completed at 4,190 feet. The rock pressure was 1,025 pounds.

A discouraging note was struck in the Cameron Township, Steuben County, area when New York State Natural Gas Co.'s well on the William Preece farm, a quarter of a mile northeast of the F. Boyd farm discovery well, found salt water in the Oriskany. This was the second well in this township and the first since completion of the Boyd well. This well topped the Oriskany at 4,091 feet and got a show of gas which was drowned out by salt water at 4,093 feet. The hole filled up 300 feet with water and was abandoned at 4,096 feet.

The possibility of a westward extension to the Sharon field likewise appeared discouraging when New Penn Development Co. drilled into the Oriskany on the Gorton-Kemp farm, a half mile west of the present production limits of this area, without reporting a show of gas. This well topped the Oriskany sand at 4,610 feet and at 4,619½ feet had not yet reported finding gas.

Another well in this area reached the top of the sand and got a show gauging 600,000 cu. ft. before shutting down to run casing. This is the well of the Sylvania Corp. on the Elmer Kemp farm within already established producing limits. It topped the Onondaga at 4,605 feet, the Oriskany at 4,736 feet and is shut down at 4,737 feet.

Programs and Meetings

Five-Day Program for Institute Meeting at New Orleans, La.

A five-day program, for discussion of technological problems confronting the industry, has been planned for the American Petroleum Institute ninth mid-year meeting May 15 to 19 in the Roosevelt Hotel at New Orleans, La. Two days will be set aside for committee meetings, of which more than 65 tentatively have been arranged. The program has been altered also to incorporate a general session, the semiannual meeting of the trade association's board of directors, and entertainment features being developed by the Louisiana oil fraternity.

The preliminary program follows:

Monday, May 15

Committee meetings.

Tuesday, May 16

Committee meetings.

Wednesday, May 17

9 a.m.—Division of Production. (Mezzanine Floor—Grand Rall Room). Drilling practice: Symposium on casing welding: (Sponsored by the Central Committee on Drilling and Production Practice). Papers on the following subjects are now under consideration by the program committee: Temperature Determination in the Cooling Beads of Arc Welds in Steel Casing. Critical-Temperature Data Obtained by the Dilatometer Method on the Various Types of Steel. Critical Cooling Velocities of Casing Steel. Application of Critical Data in the Field Welding of Casing.

10 a.m.—Division of Refining. (Second Floor—University Room). Engineering problems:

Laminated Construction for Thick-Walled Vessels, by T. McLean Jasper, A. O. Smith Corp., Milwaukee, Wis.

Lighting of Refineries and Refinery Equipment, by L. E. Priester, Texas Co., New York.

Practical Use of Engineering Factors Governing Selection of Automatic Control Equipment, by H. F. Moore, Standard Oil Development Co., Elizabeth, N. J.

Protection Against Corrosion:

Metal-Spray Protection of Refinery Equipment, by D. R. Johnson and E. K. Dewey, Jr., Continental Oil Co., Ponca City, Okla.

Field Application of 11-13 Per Cent Chrome Lining, speaker to be announced.

Pressure-Vessel Linings of 11-13 Per Cent Chromium Steel, by R. K. Hopkins, M. W. Kellogg Co., Jersey City, N. J.

Utilization of Petroleum Coke as a Lining in Pressure Vessels, by H. W. Camp and L. D. Mann, Cities Service Oil Co., Tulsa, Okla.

10 a.m.—Board of Directors: (Mezzanine Floor—Room G).

2:30 p.m.—General Session: (Mezzanine Floor—Grand Ball Room). Address by Charles F. Roeser, Roeser & Pendleton, Inc., Fort Worth, Tex. Address by E. De Golyer, Dallas, Tex.

Thursday, May 18

9:30 a.m.—Division of Production. (Mezzanine Foor—Grand Ball Room). Drilling practice: (Sponsored by the Central Committee on Drilling and Production Practice). Papers on the following subjects are now under consideration by the program committee:

A Preliminary Evaluation of Factors Controlling Rate of Penetration in Rotary Drilling. Kinked Drill Pipe. Design for Casing Strings.

10 a.m.—Division of Refining. (Second Floor—University Room). Miscellaneous topics:

Laboratory Method for Indicating Typical Road Performance of Motor Fuels, by Herschel G. Smith, Gulf Oil Corp., Philadelphia, Pa.

Midget Poly Plants, by Gustav Egloff, Universal Oil Products Co., Chicago.

The Shape of Things to Come, by J. B. Macauley, Chrysler Corp., Detroit, Mich.

Chassis Dynamometer and Road Tests of Alcohol-Gasoline Blends, by C. W. Phelps, Consulting Engineer, Chicago; and L. L. Lichty, Yale University, New Haven, Conn.

The Solutizer Process for the Extraction of Mercaptans, by D. L. Yabroff, Shell Development Co., Emeryville, Calif.; and L. E. Border, Shell Oil Co., Wood River, Ill.

10 a.m.—Public Relations—Group Session. (Mezzanine Floor—Room E).

Public Relations for Business, speaker to be announced.

Industrial Relations as Public Relations, speaker to be announced.

Symposium: Public Relations Within the Petroleum Industry, by Daniel T. Pierce, Sinclair Refining Co., New York; and James Tanham, Texas Co., New York; additional speakers to be announced.

2 p.m.—Division of Production. (Mezzanine Floor—Grand Ball Room). Production practice and materials: (Sponsored by the central committee on drilling and production practice). Papers on the following subjects are now under consideration by the program committee:

Selective Exclusion of Fluids From Wells. Horsepower and Load Requirements for Pumping Wells. Cements for Oil Wells. Fatigue Effects in Roller Chain.

2 p.m.—Division of Refining. (Second Floor—University Room). Aviation fuels:

Aviation Fuels—Present Needs and Future Developments, by S. D. Heron and H. A. Beatty, Ethyl Gasoline Corp., Detroit, Mich.

Discussion by Arthur Nutt, Wright Aeronautical Corp., Paterson, N. J.; L. S. Hobbs, Pratt & Whitney Aircraft Corp., East Hartford, Conn.; William Littlewood, American Air Lines, Chicago; and Walter Hamilton, T.W.A. Transport, Inc., Kansas City, Mo.

7 p.m.—Complimentary dinner. (Mezzanine Floor—Grand Ball Room). The local oil and supply companies in New Orleans have arranged for a dinner and entertainment at the Roosevelt Hotel, for registered out-of-town members attending the ninth mid-year meeting. It will be a stag affair and informal.

Friday, May 19

Golf tournament, New Orleans Country Club, New Orleans, La.

Ark-La-Tex Chapter Holds Dinner Meeting

A dinner meeting, attended by 170 men, marked the start of the new Ark-La-Tex chapter of the A.P.I. in Shreveport, La., last week. W. C. Spooner, consulting geologist of Shreveport, gave a general survey of the oil development of the tri-state area.

CALENDAR

April

NATIONAL PETROLEUM ASSOCIATION, semi-annual meeting, Hotel Cleveland, Cleveland, Ohio, April 13-14.

OIL BURNER INSTITUTE, fifteenth annual meeting, New York, April 18.

AMERICAN PETROLEUM INSTITUTE, Division of Production, Mid-Continent district, Skirvin Hotel, Oklahoma City, Okla., April 18-19.

SOUTHWESTERN SALES MANAGERS CONFERENCE (joint meeting of Tulsa Sales Executive Club and Tulsa Advertising Federation) Mayo Hotel, Tulsa, April 19.

OIL-WORLD EXPOSITION, Houston, Tex., April 24-29.

May

PETROLEUM ELECTRICAL SUPPLY ASSOCIATION AND PETROLEUM INDUSTRY ELECTRICAL ASSOCIATION, Rice Hotel, Houston, Tex., May 2-4.

NATURAL GASOLINE ASSOCIATION OF AMERICA, Hotel Tulsa, Tulsa, Okla., May 3-4-5.

NATURAL GAS SECTION, A.G.A., annual meeting, Tulsa, May 8-11.

AMERICAN PETROLEUM INSTITUTE, ninth midyear meeting, Roosevelt Hotel, New Orleans, La., May 15-18.

NATIONAL OIL SCOUTS ASSOCIATION, Houston, Tex. May 18-20.

NATIONAL ASSOCIATION OF PURCHASING AGENTS, annual convention (Oil Company Buyers' Group), Fairmont Hotel, San Francisco, Calif., May 21-25.

WORLD AUTOMOTIVE ENGINEERING CONGRESS, sponsored by S.A.E. for New York (May 22-26), Indianapolis (May 20), Detroit (May 31-June 2), San Francisco (June 6-8), May 22-June 8.

June

ILLINOIS-INDIANA PETROLEUM ASSOCIATION, seventh annual conference, Robinson, Ill., June 3.

PENNSYLVANIA GRADE CRUDE OIL ASSOCIATION, Hotel Hershey, Hershey, Pa., June 15-16.

THIRTEENTH INTERNATIONAL CONGRESS OF CARBIDE, ACETYLENE, OXYACETYLENE WELDING AND ALLIED INDUSTRIES, Munich, Germany, June 25-July 1.

AMERICAN SOCIETY FOR TESTING MATERIALS, forty-second annual meeting, Chalfonte Haddon Hall, Atlantic City, N. J. June 26-30.

August

MICHIGAN OIL AND GAS EXPOSITION, Mount Pleasant, Mich., Aug. 1-6.

September

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, New York. September 4-8.

OIL WORKERS INTERNATIONAL UNION, Hammond, Ind. September 5.

AMERICAN CHEMICAL SOCIETY, Detroit, Mich. September 9-13.

October

INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA, tenth annual meeting, Fort Worth, Tex.

NATIONAL SAFETY CONGRESS AND EXPOSITION, Chalfonte Haddon Hall, Atlantic City, N. J. October 16-20.

November

AMERICAN PETROLEUM INSTITUTE, twentieth annual meeting, Stevens Hotel, Chicago, November 13-17.

ENGINEERING and OPERATING

In This Issue

APRIL 13, 1939

COMBINATION RIGS USED IN VAN HORN, MICHIGAN, FIELD

By Harry F. Simons ..... *Page 34*

Operators in the Van Horn, Michigan, field have inaugurated the practice of drilling one-third of the hole with rotary rigs and the other two-thirds with cable tool rigs due to the thick glacial drift.

HYDROGEN SULFIDE REMOVED BY TRIPOTASSIUM PHOSPHATE

By J. M. Mullen ..... *Page 37*

Refinery gases are treated with a tripotassium phosphate solution at the new Richfield Oil Corp. refinery located at Watson, Calif. After treatment these gases pass to a catalytic polymerization unit.

ABSTRACTS OF PAPERS BEFORE AMERICAN CHEMICAL SOCIETY ..... *Page 40*

REVIEW OF OPERATING PROBLEMS ENCOUNTERED IN ILLINOIS

By Ralph E. Damp ..... *Page 44*

This is a resume of the past year's development dealing with types of rigs, hole sizes, drilling costs, electrical logging, acidizing, completions, testing, repairing and producing in the Illinois basin.

HIGH PRESSURE NATURAL GAS LINE—DESIGN AND EXPERIENCE

By John A. Clark ..... *Page 48*

This paper describes the design, installation and operation over a three-year period of a 20-inch gas line with input pressure of 1,000 pounds and discharge of 325 pounds.

DEHYDRATION OF NATURAL GAS AT THREE COLUMBIA PLANTS

By H. M. Baker and J. W. Partridge ..... *Page 50*

A brief summary of the history of dehydration in the Charleston group, based on experience gained in the design, construction and operation of these three natural gas plants.

PRACTICAL WATER-FLOODING EFFICIENCY IN OIL PRODUCTION

By Harry M. Ryder ..... *Page 54*

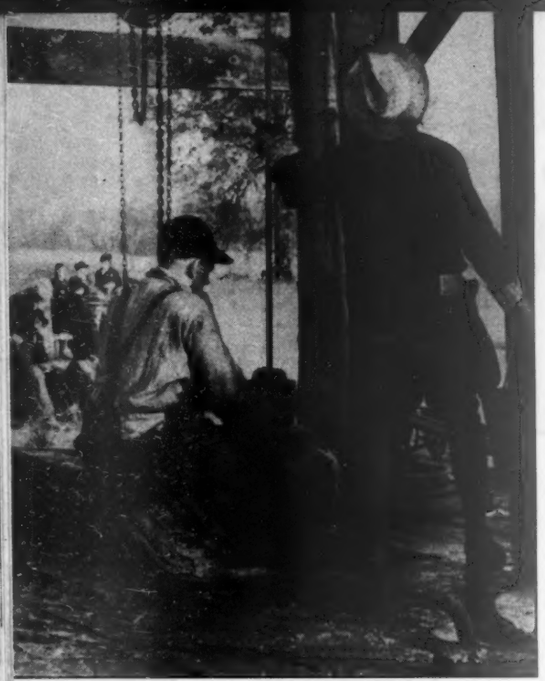
The author describes the practical considerations that are necessary to make water-flooding projects profitable.

PROGRESS IN METALS—*By W. L. Nelson* ..... *Page 36*

OPERATING IDEAS ..... *Page 39*

QUESTIONS ON TECHNOLOGY—*By C. K. Francis, Ph.D.* ..... *Page 61*

Combination Used at Van



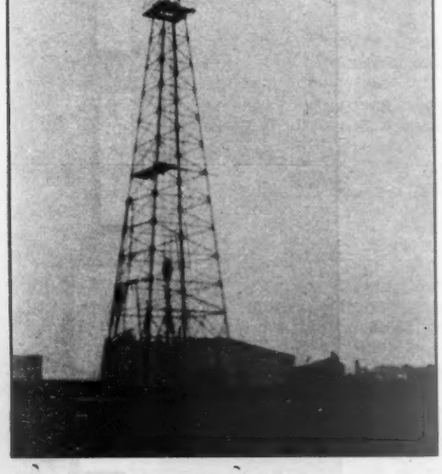
Getting ready to complete a well by the cable-tool method in southern Michigan

By HARRY F. SIMONS

A saving in time and the expense of drilling wells in the Van Horn (Freeman-Redding) field, Michigan, is being effected by the use of both rotary and cable tools although the procedure is not similar to the practice in other areas since the rotary drills only a little more than one-third of the hole before the cable tool rig or spudding machine is moved in.

The Van Horn pool is located in Sections 27, 28, 33, 34-19n-6w and Sections 3 and 4-18n-6w, Clare County. The name Freeman-Redding is derived from the name of the two townships in which it is located, although the nomenclature committee established the present name after the discovery well. There are also several Van Horn farms in the vicinity.

The structure is quite extensive in size and is a local fold along the Edenville anticline, one of the many major folds extending partially or entirely across the state. The discovery well was completed in the Dundee (driller's "Monroe formation") on July 9, 1938, the formation being topped at 3,891 feet and drilled to 3,894½ feet. It was the No. 1 Van Horn of S. J. Higelmire, trustee, and made 285 bbls. daily before acidization and 893 bbls. after being treated.



Northern rotary operation late in the winter of 1939

The second well in the field was Pure Oil Co. No. 1 Berten E. Switzer, which was completed in the Dundee from 3,899 to 3,908 feet on September 30, 1938, for 776 bbls. of oil through the tubing after acidization. This well was drilled to a depth of 762 feet with rotary tools and from there to the total depth by cable tools.

Development in the field has been rather steady with 68 producing wells being completed by the middle of March, 1939, at which time nine wells were drilling. Interest in the area was stimulated on March 16 by the completion of Michigan's largest well, the Basin Oil Co. No. 4 Van Horn, SW SW NE Section 4-18n-16w, Freeman Township. The well topped the Dundee at 3,872 feet and began flowing 30 bbls. per hour. As drilling progressed the flow increased, the well making 924 bbls. of oil in one hour and 50 minutes from a total depth of 3,882 feet. Computed on a 24-hour basis, this gives the well a potential of 12,096 bbls.

Agreement Curtails Production

The Van Horn (Freeman-Redding) field is one of the two fields in the state that is voluntarily restricted by agreement of the operators, the allowable per well being set according to the spacing by a committee selected from the operators in the field. Present allowable is 180 bbls. for wells spaced on 10 acres and 265 bbls. for wells on 20 acres. The association recently rejected an opportunity to increase the field's runs from 13,000 bbls. to 15,400 bbls. daily because it felt that to do so would unnecessarily deplete the pressure in the field. Acceptance of the higher pipe line nomination would have increased the production of each well about 50 bbls. daily.

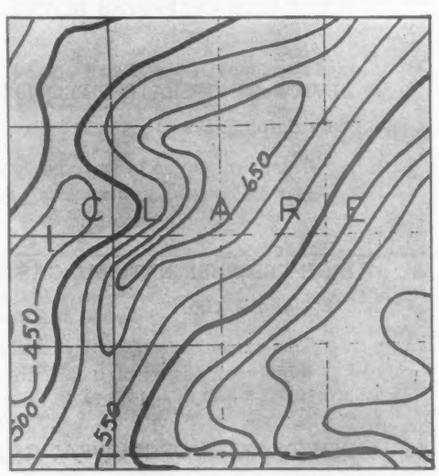
The producing formation, the Dundee, belongs to the Onondaga group of the Lower Devonian. On structure in the Van Horn and other central Michigan pools the top has been eroded, leaving a dolomitic limestone. The porosity of the dolomite is highly variable even on structure, some wells flowing naturally and others requiring acidizing before developing good production. Recovery from the lime varies between 2,500 and 7,500 bbls. per acre and a fairly long flowing life can be maintained by preserving the gas in the formation by restriction of the production.

The lime generally contains considerable water and some wells in the state have been ruined by too rapid production which developed coning and shutting off of much of the oil.

Most of the drilling in the state has been by the cable tool method, the number of rotary holes drilled in the state being unusually small. This is due to several things, the nature of the formations and the fact that many Michigan operators received their training in the eastern fields where rotaries were not common.

The upper formations throughout Michigan are generally soft and unconsolidated due to their glacial origin. In some places the Pleistocene formations reach 800 feet in thickness although in Clare County they are rarely over 650 feet or less than 550 feet. The Pennsylvanian formations are mostly red, gray and black shales with some sand, lime, and dolomite occurring in thin streaks; some of the shales are slightly pyritic. The Mississippian is composed mostly of limes, dolomites, sands and some layers of gypsum and anhydrite. The Marshall sand (1,580 to 1,718 feet), the second member above the base of the Mississippian, is a prolific water producer, being the source of much of the important brines of Michigan; the Coldwater, the base of the true Mississippian, consists of shale with a streak of fossiliferous lime.

The Mississippian-Devonian is represented by the Ellsworth-Antrim formation which is alternately shale and limy shale for approximately 650 feet. The true Devonian starts with the Traverse (3,265 to 3,894 feet), which is mostly lime varying from dark brown to buff and gray and containing some fine crystalline dolomite. Many Michigan fields find this a good source of production. The Dundee, found in the neighborhood of 3,895 feet at Van Horn, is generally a brown porous dolomite with much secondary dolomite. It varies in thickness from 50 to 350 feet, much of the variation being due to truncation; in producing fields it is rarely drilled into over 15 feet and because of its high porosity and permeability the wells have a good initial pressure even prior to acidization.



Mich. Dept. of Conservation

Isopachous contours showing thickness of drift in Clare County, Michigan

The cable-tool method of drilling has been very successful and economical below the Pennsylvanian formations, as the predominant limes, are

Drilling Method Horn, Michigan

Cable-tool driller ready to slip the clamps for drilling ahead on a Michigan test

no obstacle. However, the upper formations are so soft that they cannot be drilled and heavy 10-inch pipe must be driven through the 650 feet of glacial drift before drilling can start. The driving of the pipe frequently takes as much time as the drilling of the remaining 3,100 feet of hole. It is also a costly operation as the drive pipe is expensive and the jarring often causes it to part, necessitating a fishing job.

To add to the difficulties of cable tools for drilling the upper hole, a sand at approximately 750 feet carries considerable water and a string of 8½-inch casing is required. At approximately 1,560 feet the Marshall sand is topped and it also must be cased, a string of 6⅝-inch pipe being used. One string of pipe could be saved by driving the first string of pipe through the water sand, but this has not been entirely successful.

Two wells have been drilled entirely with rotary tools in the Van Horn field, one of these being whipstocked for a producer after the original attempt was a failure. Thirty-five days were required to drill the rotary holes to the Dundee and the high labor and bit costs discouraged operators in the area from adopting this method for drilling the entire hole.

The second well drilled in the field used a rotary to drill to 762 feet after setting 42 feet of 20-inch pipe. A string of 10-inch casing was run at that point and the cable tools took over; an 8¼-inch string of pipe was run at 1,170 feet and a 6⅝-inch string at 1,745 feet. The pay string of 5⅜-inch casing was run to 3,894½ feet. While much of the intermediate pipe can be salvaged, operators decided that a rotary hole through the Marshall would eliminate two strings of pipe and the lower hole could then be economically drilled with cable tools.

The cable tools are generally rigged up while the rotary is still drilling and as soon as the pipe is cemented the rotary is moved to the next location while the cable tools are completing the hole.

Start With Large Hole

Approximately six days are required for the rotary to drill through the drift and other formations to 1,750 feet. A 17¼-inch bit is used to drill through the muck and about 60 feet of 14-inch pipe is set. To start the hole under the surface pipe a 12-inch drag bit is used through the drift but as soon as the bit is worn out it is replaced with an 8¾-inch rock bit. The remainder of the hole to 1,750 feet is 8¾ inches.

The purpose of using a large bit followed by a small one is to prevent sticking of the drill stem due to sluffing of the unconsolidated upper formations. They cave readily and native clay is used for mixing mud to help the hole stand up. Five bits, including the drag bit, are required to drill the rotary hole. Boulders in the drift sometimes caused rotary drillers considerable trouble by falling above the bit.

One rotary being used for this work at the present time is a combination rig in that it uses both steam and mechanical power. A 100-hp. boiler is used to develop steam for the 14 by 7¼ by 14-inch duplex slush pump while the hoist is driven by a 160-hp. internal combustion engine. From time to time there have been several rigs in the field that were convertible to cable tools and rotary.

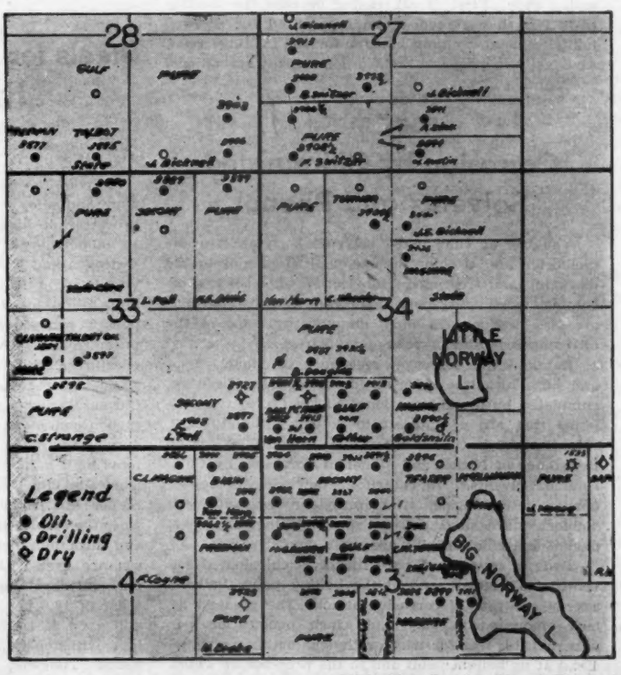
After the rotary sets the 6⅝-inch casing and cements it the cable tools drill a 6½-inch hole to the total depth, where a string of 5⅛-inch casing is set and cemented. Two-inch tubing is then run to within a few feet of bottom and the well tested. After testing, the well is acidized. At the present time there is some divergence of opinion on how much acid to use, some operators preferring one large treatment and others several small treatments; others are using only a light treatment.

The cable tools make good time through the Mississippian formations, averaging about 85 feet per tour. About 15 days are required to finish the hole after the rotary moves off. The total time by the combination method shows a considerable saving over the time required to drill the complete hole by either method.

A wide variety of cable-tool rigs are used, including steam and power-driven equipment. Little trouble is experienced in getting water for the steam rigs as the country abounds in small lakes. During the spring of the year, when snow is melting, it is no trouble to dam up a good water supply.

Rotaries are partially handicapped in the entire state by the lack of knowledge among the drilling crews as to the formations encountered. On the other hand the cable tool drillers have a long acquaintance with the formations and they know about how much footage a bit should make, the proper drilling speeds, and the economical drilling rate.

Rotary at work in the Van Horn field. It is a combination steam-mechanical rig



Mich. Map Service, Mount Pleasant

Plat of Van Horn (Freeman-Redding) area showing producers, wells drilling and dry holes

Progress in METALS

By W. L. NELSON

Oil Well Casing Welding

(Paper presented at the 1938 annual meeting of the American Welding Society by W. Mike Murphy, Air Reduction Sales Co.)

During 1937 about 29,000 oil and gas wells were drilled to an average depth of 3,200 feet—deepest over 14,000 feet—at a cost of $680,000,000. One of the major items in the cost is steel casing pipe about a foot in diameter, which is pipe used to line the hole to protect it from caving and intrusion of water. Over 20,000 miles of casing entered oil and gas wells in 1937, and it is estimated that had the lengths of casing been welded instead of screwed together with coupling, there would have been a saving of over $5,000,000.

Satisfactory welding methods utilizing either oxy-acetylene welding or arc welding with covered electrodes have been developed during the past year or two, as described by Mike Murphy. The methods are almost identical with ordinary pipe welding which has been standard practice for many years. The pipes are vertical when the welding is done just before the joint is pushed into the drill hole. Difficulties created by the high strength of casing steel have been overcome. The most popular type of joint is the bell and spigot, although other types are equally satisfactory. Two or three welders work at once on each joint so that the casing is strung with unusual speed.

There are three outstanding advantages of welded casing pipe. First of all, casing beveled for welding costs less than threaded casing required for screwed joints. Second, welding is safer for the drilling crews. And lastly, a properly welded joint is always oil and gas tight.

Corrosion by Chlorinated Solvents and Phenol

The use of chlorinated solvents such as ethylene dichloride and trichlorethylene, and of phenol in the dewaxing and treating of lubricating oil stocks is becoming more and more important. Such materials are also produced in small amounts by some of the oil companies and associated industries.

Data on the corrosion resistance of monel metal and pure nickel to chlorinated solvents has been accumulated by the International Nickel Co. in two bulletins that are of interest to refiners—Bulletin C-2, "Monel Metal in Oil Refining," and Bulletin TS-7, "The Resistance of Nickel and Monel to Corrosion by Chlorinated Solvents." In centrifuge dewaxing processes, Carbon tetrachloride, trichlorethylene, and ethylene dichloride are used and in new treating processes, phenol and zinc chloride are used.

Tests of monel and pure nickel in chlorinated solvents at 67°-86° F. and at the boiling point, indicate a very low rate of corrosive attack. The greatest attack amounted to only 0.011 inch penetration per year and this was for trichlorethylene acting on monel metal at its boiling point and in the presence of water. The attack by other solvents was lower and not more than 0.0007 inch per year for all cases except at the boiling point in the presence of water. The following solvents were studied—carbon tetrachloride, chloroform, ethylene dichloride, trichlorethylene, and a 90-10 mixture of carbon tetrachloride and ethylene dichloride. Steel causes a slow hydrolysis of carbon tetrachloride into hydrochloric acid, and is destroyed relatively rapidly. Comparisons of the rate of attack on other materials than nickel, monel and steel were not given.

Tests of the action of a 30 per cent solution of zinc chloride (Lachmann process) at its boiling point on several metals shows that monel metal is a superior material for this service (Table 1).

TABLE 1—CONCENTRATOR HANDLING BOILING 30-70 PER CENT ZINC CHLORIDE

Material—	Corrosion rates, inches penetration, per year
Monel metal	0.013-0.016
18-8 chromium nickel iron	0.020-0.024*
Lead	0.042
Yellow brass	Completely dezincified
Copper	0.056-0.062†

*Local attack, pitting. †Perforated.

A similar comparison of the action of wet boiling phenol vapor is shown in Table 2.

TABLE 2—CORROSION BY WET VAPORS OF PHENOL AT BOILING POINT

Material—	Weight lost in mg. per sq. dm. per 24 hrs.
Nickel	0.99
18-8 chromium nickel iron	1.3
Copper	5.87
Brass	9.3
Low carbon steel	37.2

Steels for Use in Cracking and Hydrogenation

Abstract: "Stahle fur Treibstoffgewinnungsanlagen." F. K. Naumann, Tech. Mitt. Krupp, Tech. Ber., Vol. 6, Aug. 1938, pp. 77-78.

A comprehensive research. The behavior of ordinary and alloy steels in cracking and hydrogenation processes at high temperatures and pressures up to 14,700 pounds per square inch, especially in contact with hydrogen and hydrogen sulfide was experimentally investigated. Unalloyed steels with various carbon contents are attacked by hydrogen even at 680° F. at 4,400 pounds per square inch after 300 hours. Increasing pressure shifts the beginning of attack to lower temperatures. Nickel steels have scarcely better resistance against hydrogen—the attack begins also at 650°-750° F. Chromium-nickel steels show a better behavior if the carbon content is low. Chromium increases the resistance to hydrogen attack, especially for chromium contents higher than 3 per cent; this is ascribed to the existence of the carbide Cr_7C_3. Chromium-nickel steels higher in carbon (0.25 and more) are less resistant, since the carbide $(FeCr)_3C$ is present. All high chromium and chromium nickel steels show excellent hydrogen resistance, even with high carbon content; a steel of 13.6 per cent chromium and 0.35 per cent carbon, and another of 16.6 per cent and 0.90 per cent carbon, were still good at 1,112° F. Austenitic chromium-nickel alloys withstood 1,382° F. without fracture after 300 hours. Tungsten and molybdenum steels have even better resistance than the chromium steels. Steels with 3 to 6 per cent chromium also possess high resistance to hydrogen sulfide. Vanadium steels are resistant to hydrogen only if the ratio of vanadium to carbon is at least 5.7 to 1.0, for below this ratio not only the resistant V_4C_3 occurs but also Fe_3C which is easily attacked. Similarly in titanium steels, about four times as much titanium as carbon must be present to be resistant to hydrogen. Neither vanadium nor titanium steels are resistant to hydrogen sulfide and furthermore are not easily forged in large masses.—Translation from Metals and Alloys, January 1939.

Metallurgical Terms

Defects in Castings

A common defect is a "blowhole." These result during the solidification of metal by evolved gas which, in failing to escape, is held in little pockets. During solidification of the last portion of molten metal (especially in ingots) a cavity or "pipe" is produced by contraction of the metal. The end of an ingot that contains the "pipe" is usually cut off and discarded. This operation is referred to as "cropping" the ingot. Particles of slag or dirt may also be entrapped during solidification and these are referred to as "inclusions."

Castings for Subzero Service

Additional data on the low-temperature strength of nickel alloy steels in the cast condition have recently been completed by the research laboratory of the International Nickel Co. The steels that were examined all contained about the same amounts of elements except nickel which was varied from 0 to 3.5 per cent, namely, carbon 0.13 per cent, manganese 0.65 per cent and 0.35 per cent silicon. All specimens (castings) were air cooled from about 1650° F. and drawn at 1200° F. The Charpy impact strength in foot pounds for keyhole notch specimens and V-notch specimens are shown

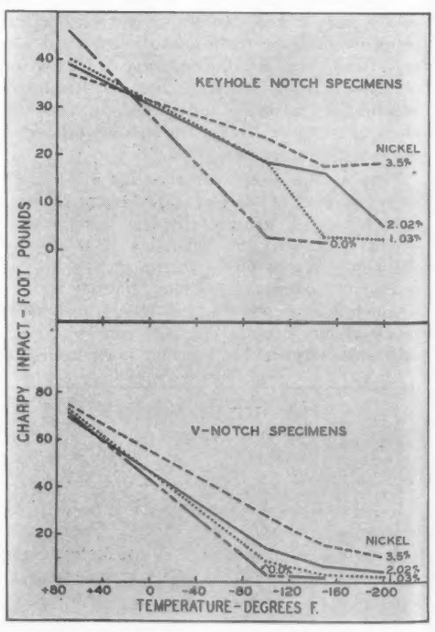
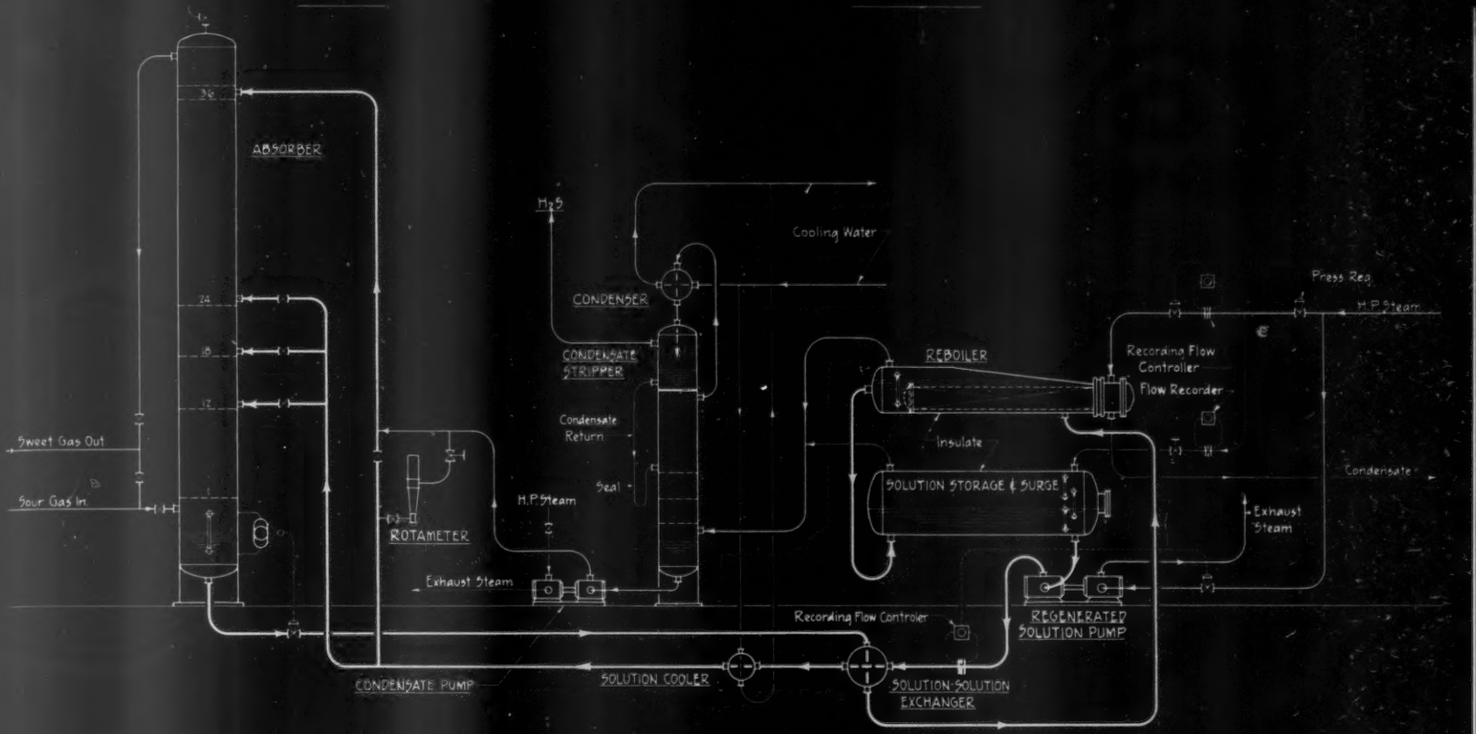


Fig. 1—Impact of nickel steel castings

in Figure 1. Similar results but slightly lower (14-17 at —200° F.) were obtained with a 3.5 per cent nickel steel containing slightly more carbon.

The Merco Nordstrom Valve Co., of Oakland, Calif., has recently manufactured a large order of valves for use in the ethyl-chloride plant of a large oil company. This service involves temperatures as low as —150° F. and pressures up to 600 pounds per square inch. A nickel (4.05), molybdenum (0.5), vanadium (0.16) steel containing only 0.08 per cent of carbon was used for this purpose. Such steel when in the cast condition, and after normalizing at 1800° to 1850° F., oil quenching from 1550° F. and drawing at about 1200° F., exhibits a Charpy impact value on keyhole notch specimens of 20 foot pounds at —150° F.



Hydrogen Sulfide Removed by Using Tripotassium Phosphate

By J. M. MULLEN
Shell Development Co.

Among the many units installed by the Richfield Oil Corp. in its recent refinery expansion at Watson, Calif., is a hydrogen sulfide removal system. The plant was fabricated and erected by C. F. Braun & Co., of Alhambra, Calif., from plans based on flow diagrams furnished by Shell Development Co. The tripotassium phosphate process used is licensed under patents assigned to Shell Development Co.

Feed to the plant is composed of a mixture of paraffins and olefins up to and including butanes contained in the overhead from the gasoline stabilizer unit. Substantially all available butene is contained in the gas. From the hydrogen sulfide removal unit the gases pass to a Universal Oil Products catalytic polymerization plant. The treat was designed to reduce 3,500,000 standard cu. ft. per day from an initial content of 3,000 grains per 100 cu. ft. to 100 grains per 100 cu. ft. Operating temperature and pressure assumed for design were 185° F. and 200 pounds gauge, respectively.

It is evident from the flow diagram that the plant is extremely simple in design and operation. Absorption is accomplished principally according to the reaction

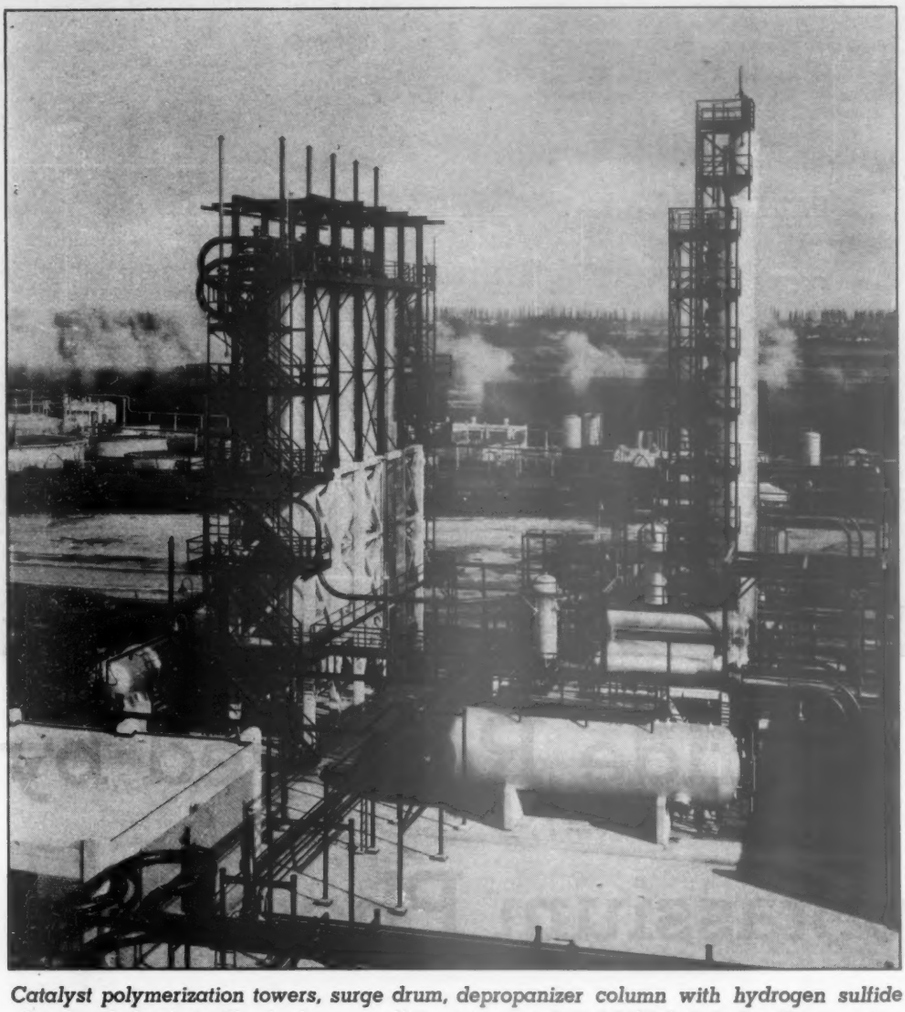
$$K_3PO_4 + H_2S \rightarrow K_2HPO_4 + KHS$$

The reaction is reversed during regeneration. Mercaptans are not removed by the phosphate process. Ammonia, when present, is absorbed by the solution and is driven off along with the hydrogen sulfide. Gases enter the absorber at the bottom, rise through 36 bubble plates countercurrent to a stream of descending absorbent solution, and pass out at the top. The absorbent is tripotassium phosphate solution containing 2.0 gram mols K_3PO_4 per kilogram of solution. It was mixed at the site from steam condensate and commercial grades of potassium hydroxide and phosphoric acid in such proportion that the mol ratio of KOH to H_3PO_4 was between 2.95 and 3.00 to 1. From the absorber the foul solution is released by level control to the regenerator. Regeneration is accomplished by concentrating the solution in a standard steam heated boiler. The concentrated solution falls to a surge tank where residence at the boiling temperature causes further regeneration. The solution pump picks up the regenerated solution and pumps it back to the absorber by way of the heat exchangers and a solution cooler. Vapors, hydrogen sulfide and steam, pass overhead from the reboiler to a condensate stripper which is a small two-plate bubble column surmounted by a condenser and a phase separator from which water is refluxed to the stripper. H_2S goes overhead to a waste products burner. Stripped condensate is returned to the top of the absorber by the condensate pump.

Utilizes Phosphate System

This plant utilizes one interesting feature of the phosphate system. The equilibrium solution saturation, expressed as mols H_2S per mol K_3PO_4, corresponding to a given concentration of H_2S in the hydrocarbon, is greater for a dilute solution than for a more concentrated one. Advantage is taken of this fact by doing the bulk of the stripping with a concentrated solution in the lower section of the absorber and using a dilute solution to remove the last traces of H_2S in the upper section. The dilute solution is made up of all the condensate and a portion of the regenerated K_3PO_4 measured by a Fisher & Porter rotameter.

In the Richfield plant the absorber is 48 inches in diameter and contains 36 bubble plates, spaced 18 inches apart, and one demister tray. Equipment was designed for peak load; wide fluctuations in gas rate and H_2S content justify the seemingly large number of plates. The concentrated solution enters at Plate 18. Heat exchangers, cooler, and condenser are of the conventional shell and tube design. The reboiler has a tapered shell 36 inches maximum diameter by 17 feet long. An overflow weir is formed by connecting the discharge line on the end of the shell. The surge tank is 60 inches diameter by 16 feet long. A 6-inch insert in the suction line to the solution pump permits settlement of any suspended matter. Solution concentration may be regulated by bleeding open steam to the surge tank or by withdrawing condensate at the stripper. The condensate stripper and phase separator are both contained in a 36-inch diameter shell. They are separated by a solid deck but connected externally by a reflux leg. Bubble plates of the stripper are similar in construction to those of the absorber. Pumps are of the steam driven double acting reciprocating type furnished by



Catalyst polymerization towers, surge drum, depropanizer column with hydrogen sulfide absorber behind it. The hydrogen sulfide stripper is just to the left of the depropanizer column

Union Steam Pump Co. Duplicate pumps are provided. As the solution is not corrosive, iron and steel are used throughout. Every possible convenience for operation and maintenance has been provided. The absorber and condensate strippers have manholes at each plate. Platforms and overhead trucks were installed to facilitate handling and inspection of heat exchanger bundles. Control of the plant is almost entirely automatic.

Processing Rate

Gas is available for processing at 175 pounds gauge pressure and 150° F. The initial H_2S content varies between 2,000 and 2,500 grains per 100 cu. ft.; mercaptans, calculated as equivalent H_2S, from 100 to 250 grains per 100 cu. ft. The volume of gas also ranges from 2,000,000 to 3,000,000 cu. ft. per day, depending upon cracking and reforming operations. At normal full load the total flow rate of regenerated solution is 40 g.p.m., of which 3.0 g.p.m. is released to the dilute solution stream. The condensate rate is 5.0 g.p.m., making approximately 8.0 g.p.m. of dilute solution. The initial charge contained about 4,000 gallons of 2.0 mol K_3PO_4/kg. solution. Heat is supplied by steam from the high pressure system at 140 pounds gauge pressure; the normal rate is 3,000 pounds per hour. To avoid any possible hydrogen condensation, the solution is fed to the absorber at temperatures slightly higher than the gas stream. Heat exchange has been excellent thus far, and it has been unnecessary to use the solution cooler. The cooling water rate to the condenser is 250 g.p.m.

For plant control, gas analysis is performed by the Tutwiler method, using standard iodine solutions with starch as an indicator. Solution concentration is checked by measuring Baume gravity with standard hydrometers. The Tutwiler titration does not distinguish between hydrogen sulfide and the lower mercaptans. As the mercaptan content of the gas is not constant, laboratory checks are made at regular intervals to determine the true H_2S content of gas before and after treatment. A potentiometric method of titration which distinguishes between H_2S and mercaptans is used. This procedure was devised by Shell Development Co. laboratory. As determined by such potentiometric analysis, the H_2S content of the treated gas has been consistently in the range of 50 to 100 grains per 100 cu. ft. Periodic analyses are also made of the chemical content of the absorbent solution.

Solution loss is a negligible item. K_3PO_4 is a stable, nonvolatile salt; it enters into no side reactions and introduces no impurity in the treated gas. A drip collecting system has been installed which picks up the leakage at the packing glands of the solution pump and the samples withdrawn for gravity determination.

Only Slight Modification

The plant was placed on stream early in October. Operation has been uneventful except on one occasion. The difficulty was overcome by a slight modification of the flow plan. Suspended material, principally iron sulfide formed from mill scale, accumulated in the solution during early operation. However, when the solution was withdrawn and the plant flushed with hot water after 10 weeks of operation, there was no noticeable corrosion in any part of the plant.

A typical daily operating statement appears in the table below. Were the cost of steam generation a matter of primary importance, steam consumption could be reduced about one-third by stripping the solution with open steam.

RICHFIELD OIL CORP. H_2S PLANT—DAILY REPORT

Refinery: Watson — 24 hrs. ending 7 a.m.	12/27/38
Gas rate—std. cu. ft./day	3,060,261
Inlet H_2S—grains/100 cu. ft.	*2,150
Outlet H_2S—grains/100 cu. ft.	*186
H_2S removal—per cent	91.5
Lbs./day	8,591
Steam:	
To concentrator, lbs./day	91,550
To surge tank, lbs./day	...
Total, lbs./day	91,550
Lbs./lb. H_2S removal	10.7
Strong solution, gal./day	57,600
Gal./1,000 cu. ft.	18.8
°Be.	49.5
Foul solution, °Be.	46.0
Weak solution:	
Strong solution, gal./day	3,499
Cond., gal./day	7,200
Weak solution, gal./day	10,699
Gal./1,000 cu. ft.	3.5
Be.	19.7

Average Operating Conditions

	Temp. (°F.)	Press. (lbs.)
Gas to absorber	149	...
Absorber top	182	...
Bottom	169	169
Strong solution	183	...
Weak solution	200	...
Concentrate	242	...
Surge tank	240	½
Accumulator top (H_2S rec.)	88	...
Bottom	212	...

*Includes mercaptans.

Buried Pipe Specimens Being Recovered for Examination

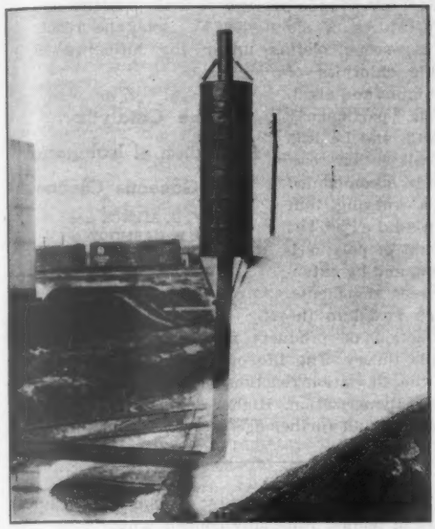
Samples of pipe buried in corrosive soils for more than five years have recently been exhumed by the Bureau of Standards for examination and are now on exhibition at the headquarter's laboratory in Washington.

Many different kinds of pipe and pipe coverings and coatings are among the lot which were buried in 15 different types of corrosive soils in various parts of the country. Some of the samples have entirely disintegrated in that time. others show deep pitting, while others exhibit no ill effects from the action of most soils. The pipes include several varieties of iron and steel, copper, brass, bronze, and different alloys, as well as an asbestos fiber pipe and many different types of protective coverings.

The corrosion tests were started by the bureau more than five years ago. Under the direction of K. H. Logan, 150 samples of each kind of pipe were supplied by manufacturers and 10 pieces of each were buried in the 15 locations. After two years underground, two samples of each pipe were dug up and examined. Another pair of each type were taken out this summer, and the remainder will be left for several years more. Definite failure of some types of pipe in certain soils was evident at the two-year test, but five years of exposure has given much more conclusive evidence of the types of alloys which will withstand long contact with extremely corrosive soils.

The pipe samples have been carefully studied by Mr. Logan and other bureau scientists, and the results of the test will be published in a technical paper which will be issued by the bureau in the near future, and which is expected to be of much value to pipe manufacturers and to the oil and other industries using pipe in large quantities. The exhibit of the samples which have been buried for five years has been visited by technicians of many pipe manufacturers and will remain on display for some time.

OPERATING IDEAS

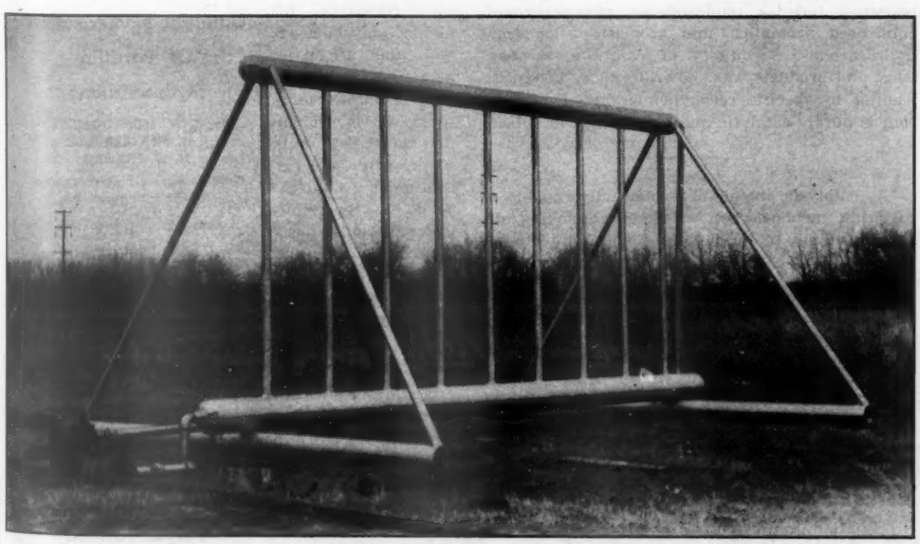


Muffler Curbs Exhaust Steam

The exhaust steam from a number of pumps was conducted by a line to a point beyond refinery tanks where it became a menace to traffic on the highway and railroad which came close to one side of the refinery property. To muffle this steam and reduce its volume sufficiently to permit safe travel at all times, a condenser-muffler was built from two oil drums, welded end-to-tend; baffles broke the steam flow and provided for condensation by contact with the steel shell. The condensate and a small amount of vapor is permitted to escape through vents cut in the bottom of the device.

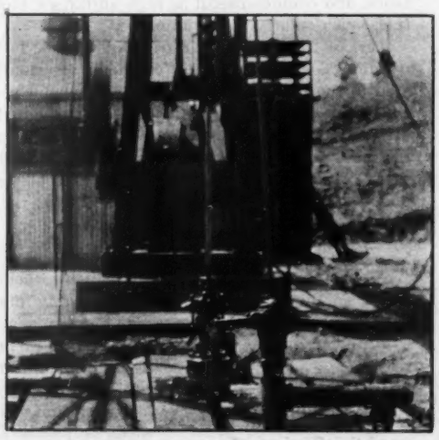
Winch for Adjusting Height of Mud Suction Lines

An elaborate method for adjusting the height of the mud suction lines has been adopted at one company rig operating in the Sand Hills field of Crane County, West Texas. Permanent supports have been attached to the mud-pump skids, with wire lines running through the pully to the suction lines as shown. Height of the lines is regulated by winches equipped with ratchets. When the rig is moved to a new location, the slush pump equipment is left intact, the mud lines being merely drawn up to a level where they will not interfere with movement of the pumping equipment.



Water Knockout for High Pressure Gas Line

This arrangement is used to remove the water from gas going to repressure shallow wells on the Greysolon Oil Co. properties near Independence, Kans. The gas enters through a 2-inch line welded into the 8-inch casing at the bottom and leaves through another 2-inch line from the far end of the 6-inch pipe on top. Water is removed through a 1-inch line at the far end of the 8-inch pipe.



Jack Pumps Cooling Water

Economy of operation is obtained by having this oil well pumping jack pump the water well by means of sand line running over the crown block and attached to the beam. The down stroke of the beam then lifts the rods in the water well. A cable clamp is used to hold the water well polish-rod while the pumping line is not attached. A loop for hooking the line to the beam is provided.

A. C. S. Abstracts

Papers presented before Petroleum Division of the American Chemical Society meetings held in Baltimore, Md., April 3 to 5, 1939.

The Production of High Octane Isoparaffinic Fuels By the Addition of Olefins to Isoparaffins

By S. F. BIRCH, A. E. DUNSTAN, F. A. FIDLER, F. B. PIM, and T. TAIT
Anglo-Iranian Oil Co., Middlesex, England

Although preliminary work indicated the general nature of the sulfuric acid-catalyzed addition of olefins to isoparaffins, attention in our earlier communication was mainly directed towards the condesation of butene with iso-butane, since these hydrocarbons gave the most promising results which could be easily translated to commercial operation. Other olefin-isoparaffin reactions have been studied and a brief account of some of the results obtained is given. These should be regarded as somewhat exploratory in nature. Of these reactions, the addition of propylene to isobutane and butenes to isopentane appear to offer the greatest promise. Acid requirements are, however, higher than with the butene-isobutane reactions.

Alkylation of Hydrocarbons

By GUSTAV EGLOFF and J. C. MORRELL
Universal Oil Products Co., Chicago

The alkylation of hydrocarbons is one of the most important reactions both from a scientific and commercial viewpoint. Alkylation of aromatic hydrocarbons is relatively simple and has been known for over a period of fifty years. Alkylation of paraffin hydrocarbons has been considered impossible because of the well-known inactivity of paraffins. However, this reaction has been accomplished in the presence of catalysts and has many possibilities in the production of valuable liquid hydrocarbons from normally gaseous hydrocarbons. For example, isobutane may be alkylated with ethylene, propene, and butenes to produce isomeric hexanes, heptanes, and octanes useful as high antiknock motor fuels, particularly for aviation.

One of the important aspects of the alkylation reaction is the elimination of the hydrogenation step in the formation of isoparaffins produced by the polymerization of olefins and subsequent hydrogenation. The alkylation process thus has the distinct advantage over polymerization and hydrogenation in accomplishing the same purpose in a single step by eliminating the latter step.

Evaluation by the Emanation Method of the Surface Area Of Metallic Hydrogenation Catalysts

By I. D. KURBATOV

Copper or nickel catalysts in which either radium or thorium X has been uniformly distributed will emit the corresponding emanation (Em. P.) from a depth of solid matter not exceeding a certain maximum distance from the surface.

The distance through which the emanation is able to travel in solids is determined by the nature of the solid and by the energy of recoil of the emanation atoms.

Using the calculated values of 372 A and 343 A as the ranges for thoron recoil in copper and in nickel, respectively, the surface areas of catalysts with various emanating powers have been calculated. It was found that when emanating power is equal to 0.15 per cent, the surface area of one gram of copper catalyst will approximate 0.018 sq.m. and that of nickel, 0.02 sq.m. When the emanating power reaches 60 per cent, the surface area will be about 9.06 sq.m. for copper and 9.83 sq.m. for nickel.

It was shown experimentally that differently prepared hydrogenation catalysts with different hydrogenation ability lie chiefly in these limits of emanating powers.

Hydrocarbons and Their Isomerization

By GUSTAV EGLOFF, V. I. KOMAREWSKY, and GEORGE HULLA
Universal Oil Products Co., Chicago

Isomerization of hydrocarbons was studied from the standpoint of their structures, reaction conditions, and yields. The mechanisms and problems encountered are discussed for the separate classes of paraffins, olefins, nonallenic diolefins, allenes, polyenes, acetylenes, cycloparaffins, cycloparaffins with unsaturated side-chains, polycyclic paraffins, cycloolefins, terpenes, benzenes, indenes, naphthalenes, phenanthrenes, condensed aromatics, and aromatic-cycloolefinic hydrocarbons. Specificity of catalysts, mechanisms, and products was shown in many instances, leading to specific recommendations. Isomerization is purely catalytic, purely thermal, or mixed.

The Catalytic Effect Of Metals on Paraffin Hydrocarbons

By CHARLES L. THOMAS, GUSTAV EGLOFF, and JACQUE C. MORRELL
Universal Oil Products Co., Chicago

As catalysts, metals are potentially capable of fostering carbon-carbon scission or cracking, dehydrogenation to form olefins, and complete decomposition to carbon and hydrogen. From the available data there is no metal that sponsors catalytic cracking or carbon-carbon scission. There is some evidence to indicate that copper and palladium are capable of sponsoring dehydrogenation to form olefins, although copper is comparatively inert unless specially prepared and palladium has a tendency to promote carbon formation. Iron, cobalt, and nickel are very powerful catalysts fostering the complete decomposition of paraffin hydrocarbons to carbon and hydrogen. It is possible that this catalytic reaction is not noticed in commercial cracking equipment because there is enough sulfur present in the oil to poison this catalytic action of the metal.

The Catalytic Alkylation of Isobutane With Gaseous Olefins

By F. H. BLUNCK and D. R. CARMODY
Standard Oil Co. (Indiana) Whiting, Ind.

At 1,000 pounds per square inch pressure and temperatures of about 400° F., isobutane reacts with gaseous olefins under the influence of double chlorides of aluminum and alkali metals, particularly $NaAlCl_4$ and $LiAlCl_4$. The alkylation reaction is accompanied by a varying, but considerable, amount of polymerization, and by extensive rearrangements, which lead to the production of products not explicable on any simple theory. The life of the catalyst is short, and the alkylation reaction declines more rapidly than polymerization. Higher temperature favors alkylation, but further decreases catalyst life.

The Suppression of Metal Catalysis in Gasoline Gum Formation

By F. B. DOWNING, R. G. CLARKSON, and C. J. PEDERSON
E. I. du Pont de Nemours & Co.

Gasoline is frequently contaminated with traces of metals, especially copper, which possess powerful pro-oxidant action. Antioxidants that are effective in retarding autooxidation and gum formation caused by peroxides, are inefficient in counteracting the effect of such metal catalysts. Gasoline-soluble compounds capable of suppressing the pro-oxidant effect of metals have been found and their use in conjunction with antioxidants is described.

Catalytic Isomerization Of Paraffin Hydrocarbons

By C. W. MONTGOMERY, J. H. McATEER, and N. W. FRANKE
Gulf Research & Development Co., Philadelphia, Pa.

The literature on catalytic isomerization of paraffins is reviewed and the fact noted that isomerization is usually accompanied by side reactions which result in the formation of higher and lower molecular weight paraffins or even more complex mixtures. It is shown that the butane with sufficiently mild treatment can undergo a reversible isomerziation comparatively uncomplicated by the formation of other products. The equilibrium constant in the liquid phase at 27° C. with five mole per cent aluminum bromide is between three and four.

Catalysis And Polymerization

By ROBERT E. BURK
Western Reserve University

Catalysis and polymerization are of wide importance in nature, so that work of the petroleum industry in these fields will have a wide influence.

Few polymerizations proceed in the absence of catalysts. Catalysts important to the petroleum industry are halides, acids, oxides, clays, oxidizing agents, metals, and organometallic compounds. The first four classes probably all act as acids through an intermediate compound mechanism. Peroxides have been grossly neglected from the theoretical side. Metals are unimportant.

Organometallic compounds probably give rise to a free radical chain mechanism when they are decomposing.

Photochemical studies should aid in evaluating the part played by free radicals in polymerization.

Extraction of Mercaptans With Alkaline Solutions

By D. L. YABROFF
Shell Development Co.

It is shown that the differences in the extractability of the various mercaptans from an oil phase by an aqueous alkaline solution are due almost entirely to differences in the solubility of the unneutralized mercaptan in the aqueous phase, rather than to differences in the acidity of the various mercaptans.

As the sodium hydroxide concentration in the aqueous phase increases, the improvement in the extraction of mercaptans becomes less than might be expected from the higher caustic concentration. This is due to the "salting-out" of the unneutralized mercaptan from the aqueous phase by the sodium hydroxide.

The extent of the extraction of mercaptans increases as the temperature is lowered, and this is due essentially to decreased hydrolysis of the mercaptide in the aqueous phase.

A rigorous method for calculating the extent of the extraction of mercaptans in a once-through countercurrent system is discussed.

Catalytic Hydration of Olefins

By V. N. SHIFFLER, M. M. HOLM and L. F. BROOKE
Standard Oil Co. of California

This paper presents the results of experimental work on the hydration of ethylene and propylene with a sulfuric acid catalyst.

Sulfuric acid proved to be an active catalyst for the hydration of ethylene and propylene at relatively low temperatures where the equilibrium is favorable for high yields of alcohols. Typical acid concentrations and temperatures were respectively 70 per cent and 150° C. for ethylene hydration, and 55 per cent and 115° C. for propylene hydration. Measurement of the equilibrium constant for alcohol formation under these conditions gave Kp 0.049 for ethylene hydration and Kp = 0.1 for propylene hydration. These values are in fair agreement with published data. Operation under pressure increased the rate of alcohol production, the concentration of alcohol in the product, and decreased the amount of water required for maintaining the acid concentration constant. Pressure also increased the ratio of ether to alcohol in the product with ethylene but not with propylene. Some phases of commercial application of the process are considered briefly.

Dehydrogenation in Oil Industry

By E. C. WILLIAMS

The high value of many olefins for specific purposes in the oil and chemical industries had led to an actual shortage of certain types and a need for specific methods of producing them by dehydrogenation of paraffins. In particular the dehydrogenation of the butanes and propane over activated alumina and chrome-alumina catalyst is discussed. The properties of these two catalysts were studied in great detail and data of their performance are presented. Although this type of catalyst is stable at temperatures favorable to the dehydrogenation from the standpoint of equilibrium, its activity decreases with time. Methods to maintain high activity and methods of regeneration are discussed.

The importance of dehydrogenation reactions in other fields is mentioned.

Gum Studies. I. The Formation and Composition of Pinene Gum

By BERNARD BERGER and R. W. BOST
Chemical Laboratory of the University of North Carolina

The effects of sunlight on pure pinene and also pinene containing various reagents were studied. Quantitative analyses were made fortnightly for peroxide, acid, and gum over a three-month period. The gum was analyzed for carbon, hydrogen, and oxygen content, and its molecular weight was determined. A mechanism for gum formation is advanced and several possible formulae for pinene gum are suggested.

The Catalytic Cracking Of Aliphatic Hydrocarbons

By GUSTAV EGLOFF, JACQUE C. MORRELL, CHARLES L. THOMAS, and HERMAN S. BLOCH

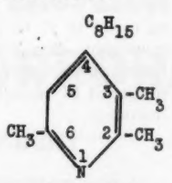
An activated silica-alumina catalyst has been employed at atmospheric pressure with a *n*-butene mixture at 385° to 600° C., pentene-1 at 400° C., a mixture of octenes-1 and -2 at 375° to 400° C., cetene at 300° to 450° C., *n*-octane at 525° to 570° C., and cetane at 500° C.

All of the olefins studied underwent isomerization to the corresponding isoolefins, accompanied by cracking to lighter products, and, in the case of the butenes and pentene, by polymerization. Octane and cetane were catalytically decomposed largely to three-, four-, and five-carbon atom products. The paraffins were much more stable than the olefins of the same chain length, and the shorter chain hydrocarbons were more stable than their higher homologs.

Structural Study Of A $C_{16}H_{25}N$ Base From California Petroleum

By STILES M. ROBERTS and J. R. BAILEY

The structure of the $C_{16}H_{25}N$ (I) nitrogen base isolated from petroleum by Thompson and Bailey [J. Am. Chem. Soc., 53, 1002 (1931)] has been established by degradation to be:



The location of methyl groups at position 2 and 6 of a pyridine nucleus was established by formation of a phthalone [Armendt and Bailey, ibid., 55, 4145 (1933)] and by oxidation of the formaldehyde condensation product to yield $C_{14}H_{19}N(COOH)_2$ (II) while on decarboxylation yielded the second lower homolog, $C_{14}H_{21}N$ (III) [Lackey and Bailey, ibid., 56, 2741 (1934)].

Fuming nitric oxidation of I to give berberonic acid established proof of alkylation at positions 3, 4, and 6. Further proof of methylation at positions 2, 3, and 6 was established by Mahan and Bailey (Mahan and Bailey, unpublished research) in pyrolysis of I to 2,3,6-trimethylpyridine. I on reduction yielded $C_{16}H_{30}NH$, a secondary amine, whose benzoyl derivative on treatment with phosphorus pentabromide followed by distillation under reduced pressure yielded $C_{16}H_{29}Br$ (IV) [Cf. J. von Braun, Ber., 38, 2338 (1905)]. By refluxing IV with methyl alcoholic potassium hydroxide a doubly unsaturated hydrocarbon, $C_{16}H_{28}$, was produced which on ozonization, followed by alkaline hydrolysis yielded acetaldehyde and a monocarboxylic acid, $C_8H_{15}CH_2COOH$ of either cyclopentyl or cyclohexyl structure.

The similarity of physical and chemical properties indicate the so-called "nonaromatics" to be of similar structure.

The Effect of Metals on the Deterioration of Motor Oil

By F. B. DOWNING, G. E. HOLBROOK and J. H. FULLER
E. I. du Pont de Nemours & Co.

The predominating effect of engine metals on the deterioration of motor oil is revealed by accelerated engine tests before and after selected surfaces in the engine were protectively "lacquered" by resin films from the lubricant. The catalytic effect of iron is greatest probably because of the more extensive surface exposed. Of the common bearing metals, copper-lead is most active, while babbitt and silver-cadmium show mild but positive catalytic effect.

A method of reducing the effect of metals while improving stability of the oil and reducing bearing wear is shown by parallel engine tests in the presence of a phosphorus oil additive.

Gum Formation in Cracked Gasolines

By D. L. YABROFF and E. L. WALTERS
Shell Development Co., Emeryville, Calif.

The formation of gum during the induction period of cracked gasolines has been found to proceed at a simple exponential rate at elevated temperatures. The time required for a gasoline to reach a gum content of 10 mg. per 100 ml. (designated as the 10-mg. gum time) is affected by temperature and oxygen pressure in essentially the same manner as is the induction period. The 10-mg. gum time can accordingly be extrapolated to storage conditions, allowing a prediction of the storage life of the gasoline.

Composition of Lubricating Oil. Properties of Lubricating Oil Fractions Separated by Distillation and By Extraction

By K. A. VARTERESSIAN, Esso *Laboratories, Elizabeth, N. J.*; M. R. FENSKE, *Pennsylvania State College, State College, Pa.*; and H. S. SMITH, *the Texas Co., Beacon, N. Y.*

No matter what the problem may be in connection with the identification and the current or potential utilization of lubricants as materials of industry and commerce, a knowledge of the chemical composition of these oils is of prime importance. This work is an attempt at introducing the chemical viewpoint in dealing with problems that concern oils. It is believed that such a viewpoint, even though an approximation at the present time will provide a more sound approach to the important problems of (1) the intelligent selection and utilization of oils for specific purposes, and (2) the reasonable choice of bases on which correlations of laboratory tests and of service performance should be founded.

Through efficient distillations, extractions, and combinations of these two operations, the investigated oil has been separated into its component

parts and the viscosities, densities, refractive indices, dispersions, and aniline points of these parts have been determined. By means of these data, conclusions as to the probable chemical compositions of the oil and its fractions have been formulated. The different manner in which the operations of distillation and of extraction classify the component parts of the oil has been definitely determined from a quantitative chemical composition standpoint.

Acidic Constituents of A California Straight-run Gasoline Distillate

By KINNEY HANCOCK and H. L. LOCHTE
University of Texas, Austin, Tex.

Crude petroleum acids from the sodium carbonate wash of Signal Hill straightrun gasoline (kindly donated by the MacMillan Petroleum Corp., Long Beach, Calif.) were fractionated as acids and as methyl esters, and fractionally neutralized by sodium hydroxide to yield a large number of fractions in which the following acids have been identified:

1. Formic acid (in water layer).
2. Acetic acid (in water layer).
3. Dimethyl maleic anhydride.
4. Propionic acid.
5. Iso- and *n*-butyric acids.
6. Iso- and *n*-valeric acids.
7. The first American naphthenic acid — believed to be camphonaic acid—from fractions not esterified by methanol containing 2 per cent HCl.

Efficiency of a Rotary Distillation Column

By BEVERIDGE J. MAIR and CHARLES B. WILLINGHAM
National Bureau of Standards

Determinations of the height equivalent to a theoretical plate (H.E.T.P.), holdup, and throughput were made on a rotary distillation column of the Pegram-Urey-Huffman type having a rectifying section 56 cm. long and 5.08 cm. in diameter. Using as rotating members (1) baskets with fine holes, (2) flat plates, and (3) cones, tests of separating efficiency were made at speeds of rotation ranging from 250 to 1,500 r.p.m. and throughputs ranging from 1 to 10 ml. of liquid per minute. The binary system methylcyclohexane-*n*-heptane was used as the test mixture. The lowest H.E.T.P. was obtained with the conical rotating members spaced 0.64 cm. apart, with which the following average results were obtained: H.E.T.P., 1.04 cm.; holdup, 1.3 to 1.6 ml. of liquid per theoretical plate; maximum throughput, 10 ml. of liquid per minute. Within the reproducibility of these experiments, there was no variation in H.E.T.P. for values of throughput from 2 to 10 ml. of liquid per minute and speeds of rotation from 250 to 1,500 r.p.m.

Rapid Method for The Determination Of Aromatic Hydrocarbons

By ARISTID V. GROSSE and RICHARD WACKHER
Universal Oil Products Co., Chicago

The method consists in determining the specific dispersion of the hydrocarbon sample boiling in the gasoline range. It is based on the fundamental fact that the specific dispersion of saturated hydrocarbons (paraffins and mono- or polyring naphthenes) are constant and independent of their molecular weight. The specific dispersion increments due to aromatics or olefins are, within reasonable accuracy, straight-line functions of their concentrations. The contribution of olefins to the specific dispersion increments can be readily evaluated from the bromine number of the sample.

The weight per cent of aromatics is given by the formula

$$\text{Weight \% aromatic} = \frac{\delta_{\text{mix.}} - 0.2 \times \text{Br.No.} - 99}{\delta_{\text{aromatic}} - 99} \cdot 100$$

if the dispersions are taken for the Hβ and Hα lines.

The determination of specific dispersion is readily made on any standard Abbé refractometer or more accurately by the Pulfrich refractometer.

Results obtained by the above method are in reasonable agreement with those obtained by standard methods.

Microviscometer

By JOHN R. BOWMAN
Mellon Institute of Industrial Research

A new type of viscometer is described, primarily designed for the examination of samples less than 0.1 gram, but satisfactory for general viscometry. The principle is the determination of the rate of fall of a short segment of liquid entirely contained in a longer capillary tube. The several sources of error, together with their corrections, are discussed. The instrument is a small, self-contained, portable unit, having an absolute accuracy of better than 4 per cent and a precision within 0.1 per cent. No skill is required on the part of the operator, and a complete determination requires about 10 minutes.

Production of Aviation Fuels by High Pressure Hydrogenation

By E. V. MURPHREE, C. L. BROWN, and E. J. GOHR
Standard Oil Development Co. and Standard Oil Co. of Louisiana

The application of high-pressure hydrogenation to the production of aviation gasolines, blending agents, and 100-octane fuels is discussed. A typical aviation naphtha hydrogenation plant (flow diagram given) at conversions of 50 to 75 per cent per pass yields 80 to 95 per cent of 75 to 78-octane hydrogenated naphtha having excellent stability, high lead susceptibility, low sulfur content, and good color. Hydrogenation of isobutylene dimers and isonormal butylene codimers increases octane number from 82 to 84, to 97 to 100. Tables showing laboratory inspection data and properties of hydrogenated fuels and polymers, and high-octane aviation fuels produced by blending hydrogenated products are included.

The Determination Of the Molecular Weights of Oils

By JOHN R. BOWMAN and WILLIAM E. HANSON
Mellon Institute of Industrial Research

A new modification of the boiling point method for the determination of molecular weights, particularly applicable to oils, is described. The equipment consists essentially of a vacuum-jacketed boiler of the Cottrell type, adapted for use with the Menzies-Wright differential thermometer. Heat is supplied electrically through a chromel wire coil. The apparatus is so constructed that no adjustments are necessary; the fixity of all parts not only makes for a more rugged and easily operated instrument, but also assures identical conditions for each experiment.

The results obtained on several pure compounds and a variety of petroleum products are given. A single determination requires about two hours and yields results with an error of less than 1 per cent. Commercial benzene serves as solvent.

Liquid-Vapor Equilibrium Relations In Binary Systems Pressure-Volume-Temperature-Composition Relations in the Ethane-n-Butane System and Pressure-Volume-Temperature Relation for n-Butane

By W. B. KAY
Standard Oil Co. (Indiana) Whiting, Ind.

The P-V-T-X relations at the liquid and vapor phase boundaries in the ethane-*n*-butane system have been worked out from measurements on a series of mixtures varying in composition from pure ethane to pure *n*-butane. The T-X diagrams of the co-existing liquid and vapor at constant pressure were constructed and a comparison was made with those computed by means of the solution laws. The results indicate definitely that the solution laws are quite inadequate for calculating these relations at high pressure. Vapor-liquid equilibrium constants were obtained for ethane and *n*-butane. Information on the effect of composition as well as temperature and pressure on the equilibrium constants of ethane is given by a comparison of the constants for ethane dissolved in *n*-butane and for ethane dissolved in *n*-heptane.

P-V-T relations for *n*-butane have been determined over the temperature range from 100° to 600° F. and over the pressure range from 35 to 1,200 pounds per square inch.

Detergents from Kerosene. I. The Alkyl Sulfates

By A. R. PADGETT and ED F. DEGERING
Purdue University Lafayette, Ind.

Sodium alkyl sulfates have been prepared from kerosene. These have been compared with similar compounds of known structure by means of a foam test and an interfacial tension test. The sodium alkyl sulfates have been prepared from all of the straight-chain dodecanols and have been similarly tested. It has been found that the sodium alkyl sulfates from secondary alcohols, although fair detergents on the basis of foam and interfacial tension tests, are not comparable in value to the same derivatives from primary alcohols, and that the derivatives obtained from kerosene are inferior to similar compounds with a terminal polar group.

The Isomerization of Cyclohexane and Methylcyclopentane

By A. L. GLASEBROOK and W. G. LOVELL
Research Laboratories Division, General Motors Corp.

The reversible isomerization of methylcyclopentane and cyclohexane catalyzed by aluminum chloride containing hydrogen chloride has been confirmed. Not more than 5 per cent of the hydrocarbon reacting is used in side reactions. The equilibrium has been approached from both sides at 10 degree intervals over the range 25 to 77.4°; the mole per cent methyl cyclopentane in the equilibrium mixture varies from 12.5 to 25° to 25.6 at 77.4°. The equilibrium data have been used to compute the thermodynamic constants for the isomerization reactions. The same constants, calculated from specific heat data, show poor agreement with those obtained from the equilibrium measurements.

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A Review of Illinois Basin Operating Problems

By RALPH E. DAMP
Eastern Division Production Supt.,
Carter Oil Co.

Exploration and exploitation efforts for oil and gas in the Illinois basin continue principally by rotary methods. During the year 1938 some 2,406 wells were drilled, of which 1,910 were found to be productive. The number of wells regarded as "wildcats" were 335 in 1938, and it is expected that 1939 will see about the same rate of activity with possibly a new high reached by late summer.

It is estimated by the American Petroleum Institute that 208,000,000 bbls. reserve were discovered in 1938, located mainly in Fayette, Marion, Clay, Richland and Wayne counties of southern Illinois. Daily average new production has reached 150,000 bbls., as of March 1, 1939, with an estimated peak of 200,000 to 225,000 to be reached this year. A new operating problem brought on by lack of sufficient market outlets is that of pipe line proration in a number of fields while adjustments are being made for the inclusion of Illinois crude to the refinery market formerly using Mid-Continent crude. Otherwise, a peak of over 200,000 bbls. would have been reached before the end of 1938.

The newer rotary rigs, commonly used now, are of the lighter type; of course, a large number of drilling contractors continue to use former equipment revamped for the shallower drilling, and most of the older drawworks are good for 4,000 to 5,000 feet. However, the lighter rigs have a limit of about 3,000 feet, using 4½-inch drill pipe. Most rigs are powered with two gasoline, semi-Diesel, or Diesel engines ranging from 80 to 175 hp. Pumps range in size from 5 by 10 inches to 7¼ by 14 inches. Most contractors use 4½-inch drill pipe, but, in all probability, 3½-inch may be used if the hole size is reduced and general production practice adopts smaller than 6-inch O.D. casing. A number of wells have been drilled successfully with heavy core drills using 2⅞-inch drill pipe, and setting 4½-inch O.D. casing. Drilling costs per foot have been lowered during the past year, and range from $1.75 for 6¼-inch to $3.50 for 8¾-inch hole up to about 3,000 feet in depth, with the contractor furnishing everything except casing and cement. Also actual drilling time has been reduced materially by better mud, close attention to pump pressures, and improved rock bits. This time averages from five to seven days to drill 1,600 feet, in Fayette County, using five to six bits. Other areas vary depending upon formation and depth. It has been noted that formations are apparently harder progressing into western Kentucky and southwestern Indiana. In the Birk City pool, an average of 12 bits are required for 1,900 feet. The trend is definitely to cut corners safely and reduce the overall per well cost as much as possible. One item which is a decided cost is the use of derricks, usually 94-foot with 24 by 24-foot base. Wooden rig bottoms are used exclusively. The cost of building or erecting, with subsequent dismantling and moving to new locations, averages about $450, including necessary replacements. Here again is a problem to reduce this cost, which represents about 10 per cent of the drilling cost of a 1,600-foot well. The light portable rotaries and heavy core drills, having their own portable masts or derricks, enjoy an appreciable saving on this item, but must necessarily pull singles thereby increasing time and decreasing the saving.

No derricks are being left over the wells, as such production is being serviced with some type of portable well servicing tractor and winch either having its own portable mast or permanent masts erected over each well. The portable units will be used later for cleanout operations.

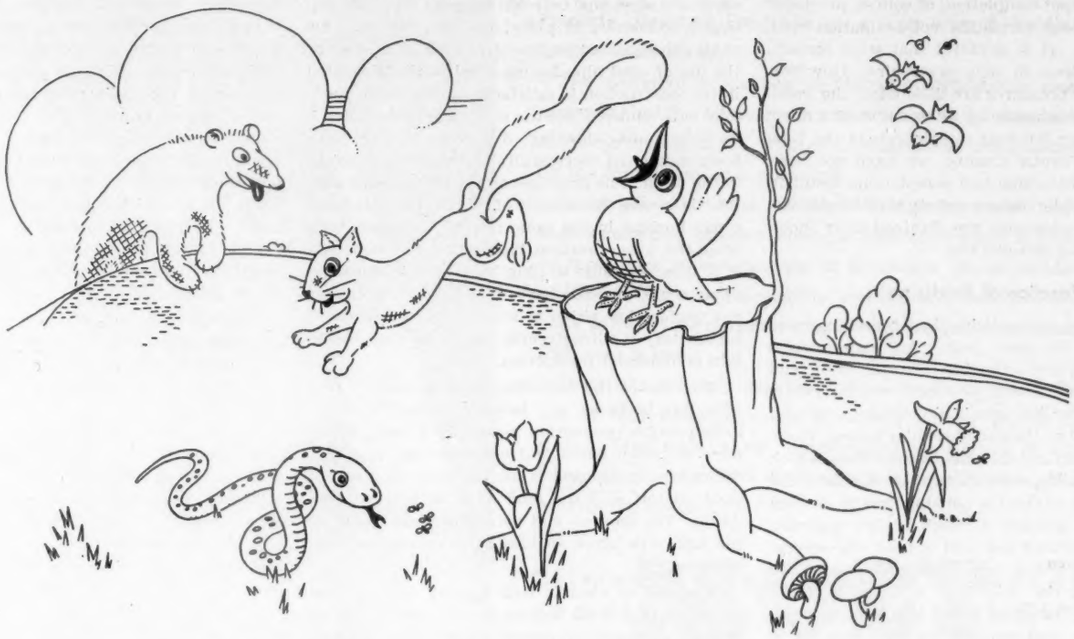
Casing size and weight is one of the first operating problems to be decided, and during the past year operators have shown a definite tendency to swing towards smaller and lighter strings. Here again appreciable investment savings can be made and the corners cut, so to speak. General practice is to set surface pipe from 50 to 300 feet, using either 8⅝-inch or 10¾-inch, in order to protect shallow fresh waters. However, where the oil string is cemented to the top, surface pipe may not be set, and this has become accepted practice in sand production along with light weight seamless or electric weld casing from the standpoint of initial cost and ultimate maintenance. Various operators are using different sizes and weights ranging from 4½ inches O.D. 9¾ pounds to 7 inches O.D. 24 pounds. The use of field welded joints is coming into prominence due to the fact that prices for Grade B have made such worthwhile. Welding technique has developed the practicability of such casing, and the cost of welding per foot usually amounts to the diameter in inches plus 2 cents. That is, for 6-inch O.D. the cost would be 8 cents per foot. The time for running welded casing averages about twice that for running thread and coupled casing, actual time being about three and six hours, respectively, for 1,600 feet.

A.P.I.—Paper presented before annual meeting of the Eastern District, Production Division, Pittsburgh, April 4, 1939

Fast setting cements are generally used and a minimum setting time of 48 hours allowed before drilling plugs. In passing through upper formations before reaching the pay horizons, numerous sands containing salt water and coal seams containing highly corrosive sulfur water are encountered. It is deemed advisable to circulate cements around the oil string where light weight casing is run, especially if a well life of five or more years is anticipated. This also protects other shallower beds penetrated that may be later productive of either gas and oil, or coal which may become workable in the future. A combination float and guide shoe, or float collar and guide shoe, is always run. The float collar is usually spaced one to two joints from bottom and aids in insuring a good cement job around the shoe. Whirler shoes are also an aid in getting a good cement job, especially where there is the possibility of water immediately above the pay; also when casing is suspended and not landed on a shoulder. In order that excessive pressures not be encountered when using light weight pipe and circulating cement, the addition of Aquagel to the cement slurry has been found very satisfactory. Also there is usually a reduction in the amount of cement required to obtain circulation when using a lighter slurry. A 3 per cent by weight Aquagel-cement lightens a regular 15-pound slurry to about 13.5 pounds, and has about the same viscosity. The Aquagel is best added dry by using a separate mixer while mixing the cement slurry. Some experiments are now being made with mixtures at the cement mills, but first results were that there was a tendency for separation during transportation and handling due to the wide difference in specific weights.

Coring is a desirable practice feature in the successful completion of the first wells in a pool, after which electrical logging can be used with an appreciable saving. Good samples, of course, are highly desirable, and here drilling mud plays an especially important part. There are numerous sands and shales that may cave and cause a great deal of additional time, and possibly some difficulty in successful cementing of casing. Within the basin area, usually there are good mud-making qualities from the surface down, but, in order to get through possible shallow water gravels, the addition of 10 to 20 sacks of artificial mud in starting the hole may save much delay and loss of time later, and is good insurance. An average viscosity of 35 to 40 seconds and about 9½ pounds mud gives excellent results. Another factor in obtaining good mud is the size of the slush pits in relation to the size of the hole and the depth to be drilled. There should be at least two baffle boards, and better three, to settle out drill cuttings. Core recoveries depend a great deal upon the condition of the mud, and the amount of coring can be reduced to a minimum with good samples allowing a geologist to pick tops within a few feet. From cores, data can be obtained regarding the formations' characteristics such as fluid content, effective porosity, and permeability that will be helpful in the future, particularly in the estimation of ultimate recoveries and advisability of secondary recovery methods, i.e., repressuring, water-flooding, etc. If recoveries are not better than 75 per cent, little is gained as to the characteristics of the formation cored.

Well completions by rotary or cable tool method continues to be a highly debatable subject, but nevertheless an important one from the standpoint of good production practice. In rotary completions, cement plugs are drilled with mud and then the drilling mud washed out with clear water. The hole may then be bailed or swabbed to test; or, if shooting is required, the shot can be run immediately after washing clean with water. The size of shot usually does not exceed 3 quarts per foot of sand and averages about 1½ quarts per foot. Thorough sand tamping, depending on weight of casing, amount of room below casing seat, and size of shot, is necessary to protect the pipe and get the maximum benefit of the nitroglycerin. By careful technique we have shot 10 quarts in 9 feet



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of room below casing seat, using an umbrella bridge and time bomb, with no damage to casing shoe or casing. If the well is to be acidized, it should be produced sufficiently to clean the formation before injecting acid by either bailing and swabbing through casing, or washed in by swabbing through tubing. Cable tool completion, of course, precludes the possibility of formation contamination with mud or water. It is doubtful that such contamination is serious in new reservoirs. However, after reservoir pressures are dissipated, the possibility of sand penetration by water and mud is much greater. In over 300 well completions in the Louden pool, in Fayette County, we have not been able to show that cable tool completions result in better wells. While there are shaly sand conditions, possibly better cleanouts are obtained after shooting by cable tool completions.

Practice of Acidizing

The practice of acidizing has been improved some during the past year. An experimental method is the use of a flexible tube run on the end of a "macaroni" string, through which acid is pumped. The flexible tube is directed into the well by a special tool on the end of regular tubing. There is a jetting action and the acid destroys lime, which allows the flexible tube to project out into the formation. In a test on the Lansing lime in western Kansas, it was possible to reach 42 feet laterally. Also, by this method less acid is used and several directional acidizations can be made. Greater drainage radii being the objective. Acidization of the McClosky and Devonian limes is a special problem, and every well requires its own analysis in order to determine the proper treatment. If water is expected at the bottom, "jelly seal" may be used to protect this zone from the acid. Also, the flexible tube method mentioned above can be used where there is close water contact. The use of packer and retainer has proven valuable in performing acid treatment in zones that are extremely tight. The size of treatment ranges from 500 to 10,000 gallons, with the average McClosky treatment being 3,000 to 5,000 gallons either one or multistage. Sometimes the use of retarded acid is found advisable to secure greater penetration, as well as varying the strength or concentration of acid used. Also, the rapid placement of acid or increased injection rate may produce greater penetration.

Something new in the use of removable liners has proven very successful in producing two or more formations in the same well. Removable liners have been employed for the past two years on the West Coast, and recently in the basin area. These liners are run in the regular string of casing and are either drilled out with a special pilot bit or with a well scraper. Recently a metal alloy has been successfully removed with hydrochloric acid. The liners can also be left in and removed at a later date, when required, thus exposing the pay formation completely so that it can be shot and cleaned out in the same manner as if pipe had originally been set in the sand. In running removable liners, we have found that these should be placed with a shoe at the top and bottom of the liner, the shoe on the bottom of the liner being inverted, and it remains in the hole on top of the steel pipe below. This affords a much better opportunity of entering the lower formation with tools, especially for later cleanout work. We have found the best procedure is to complete the well in the lower formation first, and then plug back with sand and a sack or two of cement on top before removing the liner section. This gives a chance to definitely complete each sand or zone separately and thereby actually know the actual production from each horizon. Where it is necessary to shoot with nitroglycerin, we have established the practice of not using a removable liner where there is less than 15 feet of upper pay, because we feel this room is necessary for glycerin in order to protect the pipe, and at least 25 feet should be between the pay horizons for steel pipe where the formation between the two pay horizons is shale or may have a tendency to cave. The 25-foot section of steel pipe between the pays must be thoroughly cemented in place; and we find that coaxial spiral placed on the steel pipe as a strip or the use of steel pipe having a spiral rib fabricated in its construction is satisfactory. Otherwise there may be a tendency for the steel pipe to drop down on bottom after shooting. A number of wells have been completed successfully in the above manner in the basin. The principal object of the removable liner is to save the expense of twin wells, or to treat a pay horizon in the same manner as a new well after the lower horizon has been fully depleted; it is then desirable to plug back and produce the upper zone, and not have to resort to ripping or gun perforation, either of which is not particularly satisfactory if nitroglycerin has to be used to obtain commercial production.

The use of the drill-stem tests to explore possible pay horizons is a helpful method to determine possible production, especially if these zones have not been cored and oil stains are noted in the cuttings. Aquagel is usually used to insure a good shutoff, and the mud must be in good condition. The amount and nature of fluid found in the drill pipe gives an idea as to productive possibilities.

The use of electric well logging is a method of surveying wells to obtain information as to possible productivity, possibility of water, the position of relatively thin lime sections that may be used as casing seats, and other important data that may be used in plugging back or subsequent perforation of casing for production that may be cased off originally. Another sideline is the use of the "electric eye," or acid solution, for determining the exact point at which water may be encroaching. These methods reveal casing leaks, poor cement jobs around the shot, or definite bottom-hole water, and is a great aid in determining the proper corrective procedure at a small cost rather than use the old "cut and try" method.

Shutting Off Water

The use of cement retainers has sometimes proved successful in shutting off bottom-hole water, water coning, water leaks around the shoe, or leaks within the casing itself. The gun perforator has been used a great deal for casing perforation, but usually satisfactory commercial production cannot be obtained by perforation alone in sand of low permeability which requires shooting with glycerin. Shooting through casing into productive limes is very successful.

Pumping is always a problem. There are either sand conditions, shale caves, or salt water emulsions. Emulsions must be effectively treated at a relatively low cost for efficient operation. Loose emulsions can be handled through a settling tank, if the gas is removed first so that there is a minimum of agitation. But generally there later develops paraffin difficulties and probably tighter emulsions which require the addition of chemical and heat. Thus the installation of an efficient closed treater is probably the best answer. There are a number on the market with various outstanding points. The idea of having a self-contained treater to which heat can be added when necessary is the most satisfactory way to reduce b.s. to a minimum and keep storage tanks clean, holding evaporation losses to a minimum. It is expected that oils from the basin area will give some paraffin difficulty, especially in cold weather. If gas can be kept from the lead lines paraffin will deposit very slowly, especially if the lines are buried to reduce wide temperature changes. Alternate wetting and drying by gas in the lead lines accelerates paraffin deposition. In extremely obstinate cases lead line heaters may be necessary. Subsurface pumping equipment, if kept in good condition, will do much to remove b.s. difficulties. In all probability common working barrels and cups will be used by most operators. However, there are a number of metal to metal plunger pumps now available at reasonable prices which may be used in special wells that are difficult or expensive to produce with cups. A number of the wells now are producing by the use of central power. However, in the Centralia, Salem, Dix, and Louden pools, there is a definite trend toward individual pumping units. Electricity will undoubtedly be the source of power, and already major and independent operators alike are using it almost exclusively in the above pools. Individual pumping units range from 3.5 to 7.5-hp. gear boxes with polish-rod capacities from 4,500 to 10,000 pounds.

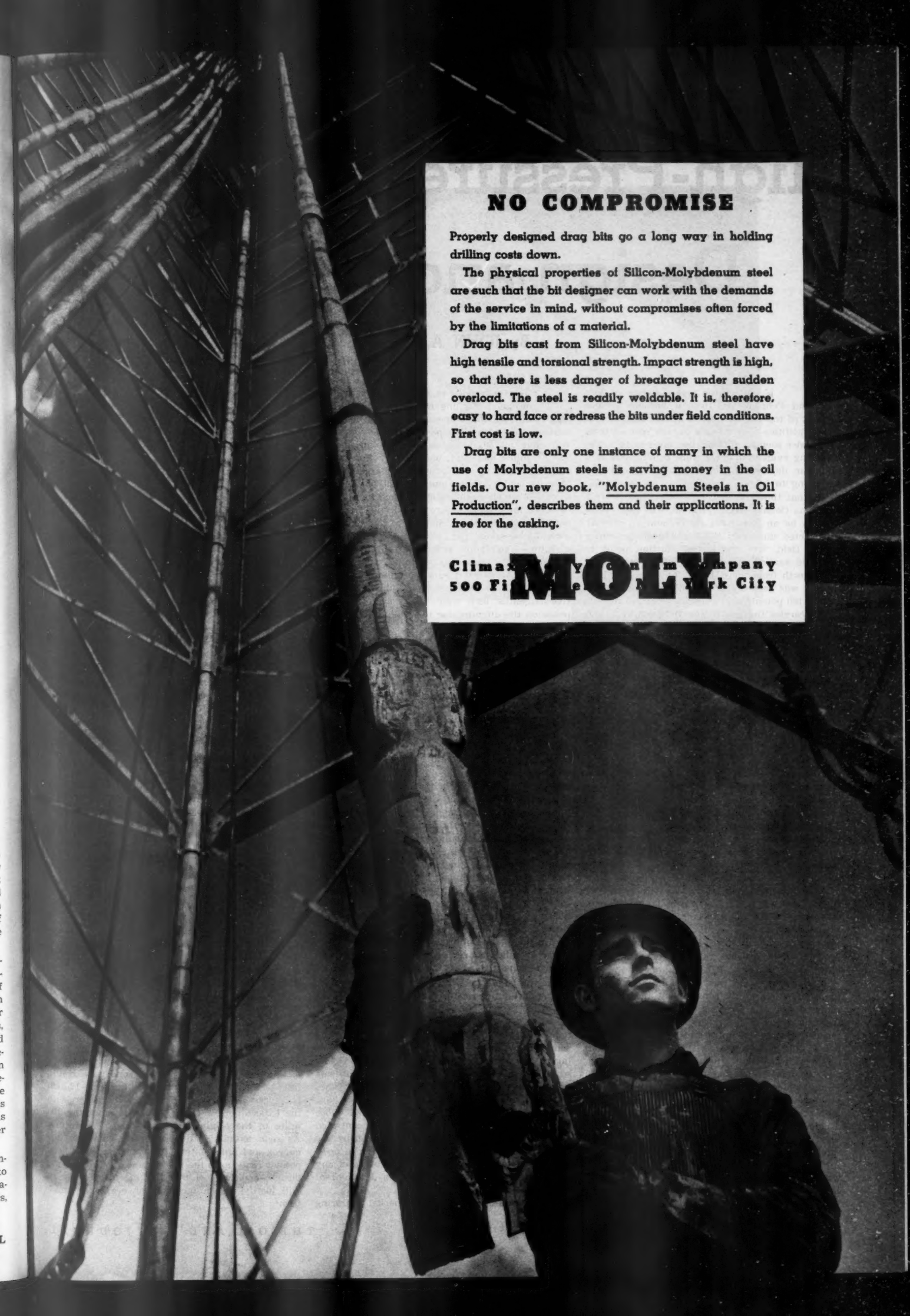
Another possibility that should be carefully explored is the use of meters for measuring the fluid produced by individual wells or leases. This will afford an opportunity for the consolidation of tank batteries at a central point, the installation of central treating plants, and subsequent salt water disposal which will greatly aid in efficient and low-cost operation. A salt water disposal well is being successfully used in the Dix pool of Jefferson County, Illinois. The Pottsville sands, about 150 feet in thickness, carry salt water and this well has an input of about 75 bbls. per hour at 300 pounds. Subsurface disposal will undoubtedly be widely used in the future, if formations can be found to take large volumes of water for a long period of time.

Well Spacing

Well spacing is an extremely important problem in the efficient development of reserves. Reserves must be estimated before the proper well spacing can be determined which will yield the greatest ultimate economic recovery. Periodic reserve estimates must be made to keep abreast of competitive well spacing and its effect on the ultimate recoveries. Pressure maintenance or modified repressuring materially increases recoverable reserves, and such methods tend toward wider well spacing. Restricted withdrawal will insure a more uniform production rate over a longer period of time, which in turn tends to stabilize production volumes, smoothing out periods of peak production and possible low market values, and thus making for steadier income return on capital investments. In general, production experience gained from other pools proves conclusively that curtailed production early in the life of the field yields greater ultimate recoveries in comparison to capacity production with resultant dissipation of reservoir energy destroying the highly fluid state of the virgin oil.

Pressure maintenance, or modified repressuring, is being practiced in two basin pools at present; by the Carter Oil Co. in the Louden pool of Fayette County, and by the Texas Co. in the Salem pool of Marion County, Illinois. Original reservoir pressure in the Louden pool was about 650 pounds, and at present about 580 pounds (in the north end where repressuring is being applied). Gas returns to the sands at 650 to 750 pounds and in sufficient quantity to maintain a low rate of decline in reservoir pressure. Gas injection will be slow in order not to create gas caps. Input wells are located in the center of eight producing wells in each quarter section, and the adjoining quarter sections.

These are only some of the problems encountered in the basin area, and are pointed out to instill ideas and encourage discussion and application which will be of interest to all producers, thereby benefiting the industry as a whole.



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High-Pressure Line— Design and Experience

By JOHN A. CLARK
Hope Natural Gas Co.

After the severe storms of January and February in 1936, it became evident to most of the gas companies in this section that added facilities were needed to take care of their load under such conditions, the more so as it was becoming evident that we were coming out of a four-year depression, and industrial loads were beginning to increase rapidly.

At that time the new Oriskany sand field in Kanawha County, West Virginia, was just beginning to be an important factor, and an already constructed station on Elk River, near the center of the field, was the logical starting point to assemble new supplies, with Hastings station, 95 miles north from there, being the point at which the gas was needed. At Hastings we have a suction of 100 pounds, and a discharge of 325 pounds which carries the gas to the Ohio markets, and later it was intended to extend this line about 105 miles north into Ohio.

The first plan considered was a 20-inch coupled line, which, with 350 pounds at the Elk River, and 100 pounds at Hastings, would give a flow of about 75,000,000 cu. ft. per day, which gas would then have to be compressed at Hastings to 325 pounds for further transportation. The new 20-inch line would cost, laid through this country, about $24,000 per mile, or, roughly, $2,500,000.

However, during the depression, the improvement in steel pipe manufacture had been very marked, and seamless steel pipe was now available at very little extra cost over the old-fashioned lap-welded pipe. With the lap-welded pipe working at 350 pounds, the safety factor is about five; but with the absence of a seam we felt safe in decreasing this safety factor to three, which, with the increased strength of Grade B seamless pipe, gave a safe fiber stress of 22,000 pounds per square inch, against 11,000 pounds in the lap-welded pipe: For these reasons we began to consider laying instead of 20-inch a smaller pipe working at quite high pressures, and feeding directly into the discharge of 325 pounds at Hastings.

The next question was what kind of couplings to use? We carefully consider all the types in common use, also couplings with piston rings in them, and grooves in the pipe; but all these seemed to show possibilities of rather heavy leakage at high pressures. At that time practice in the West was steadily toward increased welding, and the latest lines had been laid with 2 to 10 joints welded into one piece, and these sections put together with a coupling for expansion. For high pressure we wanted a solid line, and finally decided that with the number of bends necessitated by the West Virginia terrain, the line could safely be made solid with no expansion joints.

The grade of steel finally chosen was Grade B, with a carbon content of .32 per cent, and a breaking strength of 65,000 pounds per square inch, which was the highest carbon content steel that could safely be welded and bent in the field.

We designed the line for the full 200 miles, and found by the conventional pipe line flow formula that with 1,300 pounds at the south end we could put 50,000,000 cu. ft. per day through the 200 miles, and later, with a relay of from 500 pounds suction to 1,000 pounds discharge at Hastings, we could step this up to 75,000,000. For wall thickness we chose three-eighths inch for the first 65 miles until the pressure had dropped to 1,000 pounds, and from there changed to five-sixteenths inch thickness for the last 30 miles. This gives a factor of safety on ultimate strength of three, and so far has proven to be amply safe.

For the joints we used arc welding, four beads on three-eighths inch walls, and three beads on five-sixteenths inch walls. We saved some expense on the ditching due to welding, as we used an average depth of 30 inches against an average depth of 36 inches for coupled line. To take care of expansion, we contracted a 24-inch wide ditch instead of the usual 18-inch, and crowded the pipe to opposite sides of the ditch every five or six joints. However, the main provision for expansion was that due to the roughness of the country, we averaged, during construction, 63 bends per mile, and there were few places where more than four straight joints were laid. That this was ample protection has been proven by three winters of operation with no trouble from this source. Another departure from standard practice was the total absence of any drips in the entire length of the line, and the small number of dividing gates, only three being used in the entire 95 miles. River crossings were laid with a single pipe instead of the usual headers.

A.P.I.—Paper presented before annual meeting of the Eastern District, Production Division, Pittsburgh, April 4, 1939

At this time, in 1936, the subject of hydrate formation, at temperatures well above the freezing point of water, was beginning to be understood, and we realized, that to operate at these temperatures successfully, we must have an absolutely dry line. We had meter records showing gas temperatures in winter as low as 30° F., so we felt that we should have a dewpoint at least as low as 25° F. We considered various types of hydration plants, but, principally on account of its flexibility for future conditions, we chose a plant scrubbing the gas with a concentrated water solution of calcium chloride, chilled by ammonia refrigeration. This plant has been in operation now for three years with no trouble of any importance so far, and producing a dewpoint of between 20° and 25° F. . . .

The tightness of the line is remarkable. During last summer's shutdown of five months, the pressure was actually higher on the line at the end of the shutdown than it was at the start, due to a slight increase in temperature, proving that the leakage was practically zero.

Since its completion, we have run a series of very complete and accurate tests with rather surprising results. We found that as we increased the pressure, the carrying capacity of the line increased considerably above that shown by the standard Weymouth pipe line flow formula, approved by the American Gas Association. As is well known, natural gas is not a perfect gas, but at high pressures compresses more than a perfect gas should. We found by our tests that the carrying capacity of the line increased over the capacity expected from the A.G.A. formula by a percentage approximately the same as the percentage of supercompressibility of the gas at the average pressure in the line. We have tested the supercompressibility of a number of gases common to this region, and find that this varies from zero per cent at atmospheric pressure, to as high as 36 per cent at 1,500 pounds and 40 degrees temperature. In other words, the high-pressure line will exceed the capacity expected from the standard formula at an average pressure of 300 pounds by 6 per cent; at 500 pounds by 11 per cent; at 800 pounds by 18 per cent; and at 1,000 pounds by 24 per cent for an average dry gas. We are not equipped to go above 1,000 pounds with any large volume with our present machinery, so no statement can be made above that pressure. The average pressure in the line is easily figured by the formula:

$$\text{Average} = 2/3\ \left(P_1 + P_2 - \frac{P_1 P_2}{P_1 + P_2}\right)$$

This means that when we designed the line we expected, with 1,000 pounds at Cornwell and 325 pounds at Hastings, to pass 63,000,000 cu. ft. per day, but now find that we can put through, at these pressures, 74,000,000 cu. ft.; or a 12-inch line has practically the same capacity as a 20-inch line operated at 350 pounds and 100 pounds outlet. The average cost for 20-inch in this country will be $24,000 per mile, and 12-inch can be built for less than $15,000 per mile, or on a 100-mile line there will be a saving in first cost of nearly $1,000,000.

In conclusion, after three years of successful operation, we feel that the design of this type of line has been amply justified, and, as a result, this summer we are laying a single line, 12-inch high pressure crossing across the Ohio River, with the expectation of completing the remaining 105 miles of the original design in the near future. As soon as this is done, we can complete our curves and information from the present 1,000 pounds limit up to the 1,300 pounds of the original design, and we feel that the increased capacity will justify this design from an economic standpoint.

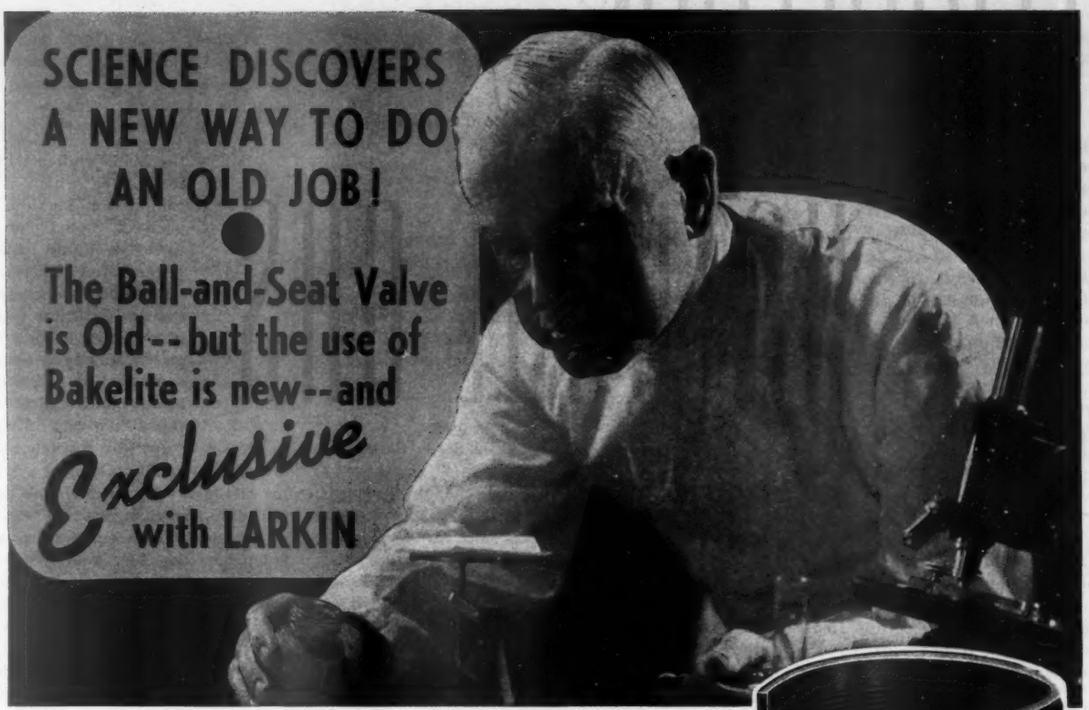

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Fig. 428

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DEHYDRATION of NATURAL GAS

By H. M. Baker and J. W. Partridge

United Fuel Gas Co., Charleston, W. Va.

Three natural gas dehydration plants, each utilizing a different process, are in operation in the Charleston group of the Columbia system.

A brief summary of the history of dehydration in the Charleston group. based on experience gained in the design, construction and operation of these three plants, follows:

Dehydration of natural gas was first studied and considered in the Charleston group in 1935 as related to a group of transmission lines in the central part of West Virginia. Large quantities of condensate made the operation of these lines extremely hazardous and inefficient. It was determined that the installation of a dehydration plant on the outlet of the field compressor station pumping gas into these lines, would eliminate the hazard of line freezes by extracting enough water from the gas to lower the water vapor dew point below existing line temperatures.

A further important consideration was that this particular gas would not be treated in any manner until it reached a natural gas drying station some 20 miles from the field compressor station. Calculations and line drip collection records indicated that considerable quantities of hydrocarbons or natural gasoline were being and would continue to be condensed in the line, and that the quantity of such condensation would be sufficient to materially lower the carrying capacity and vitally affect peak deliveries through the line. The advantages gained by extracting from the gas only those hydrocarbons normally condensed in the line namely, utilization of full line capacity during peak periods and the recovery of natural gasoline otherwise lost in blowing drips, would offset the additional investment required for such type plant over that required for a straight water dehydration plant. Therefore it was decided to install a combination water dehydration plant and partial condensable hydrocarbon removal plant, using a refrigerated calcium chloride water solution.

Operating Data

The contract for the design, engineering and furnishing of equipment was awarded to a prominent construction company and the plant was built by the construction division of the Charleston group. The plant was designed to treat 70 million cubic feet of natural gas per 24 hours at 325 pounds pressure at an average inlet gas temperature of 65° F. during the winter months. The gas was to be treated for the removal of water and condensable hydrocarbons before entering the transmission line so that water and hydrocarbon condensates would not drop out in the line between the Lewis and Spencer compressor stations, a distance of 16 miles. The gas was to be overtreated so that 7 million cubic feet of raw gas could be added to the pipe line system at Spencer station and the pressure again raised to 325 pounds with no deposition of moisture or hydrocarbon condensate in the line beyond Spencer compressor station.

The principle under which the plant would function would be the application of low temperature to the gas at high pressure, thereby condensing out all hydrocarbons which would condense at this temperature and pressure. In addition to the application of low temperature, the gas was to be scrubbed with a hydroscopic solution to remove water vapor.

Commercially Dry

The plant was placed in operation December 1, 1936, and Line H was reported as commercially dry three weeks later.

A description of the operation of this plant, considering each flow cycle separately, follows:

Gas flow.

Warm gas carrying water vapor and condensable hydrocarbons enters the tubes of the gas to gas heat exchangers where it is cooled by cold gas in the shell side returning from the contactor to the main line.

The gas enters a separator which removes the entrained liquid condensates which have dropped out in the heat exchangers, and then enters a contactor and chilling column where it is chilled and scrubbed by a cold solution of calcium chloride. The temperature at the top of this column is controlled to produce the required hydrocarbon dew point and the concentration of the calcium chloride solution is controlled to produce the required water vapor dew point.

The chilled dry gas leaves the top of this column to enter the shell side of the gas to gas heat exchangers returning to the main line.

Calcium chloride flow.

Refrigerated calcium chloride brine is pumped into the top of the brine gas contacting column. This brine cools the gas and absorbs the water vapor from the gas. Condensable hydrocarbons are thrown down into the brine due to the chilling of the gas.

The calcium chloride with condensable hydrocarbons then enters a pressure separating chamber where the hydrocarbons are separated from the brine and removed from the system. The brine passes through a chiller where it is cooled, after which it is pumped back into the contactor.

A small portion of the brine is withdrawn from the main circulation and sent to a brine reconcentrator, where the moisture collected from the gas is driven off to atmosphere. Reconcentrated brine is returned to the system as required.

Refrigerant flow.

Liquid ammonia flows from an accumulator to the brine chiller where it is vaporized, after which it passes to the compressor suction. It is recompressed, cooled, condensed and returned as liquid to the accumulator.

Very few operating difficulties have been encountered in this plant. One in particular was the formation of hydrates in the tube side of the gas to gas heat exchangers due to condensation in the tubes at temperatures below hydrate formation. This possibility was anticipated and was solved by continuously circulating a small amount of calcium chloride directly through the tubes of the heat exchangers.

The temperature of the gas passing to the dehydration plant is reduced some 30° in the heat exchangers, thereby materially reducing the refrigeration requirements. This results in a substantial saving in investment and reduced operating cost.

A further important feature is that the dew point of the gas leaving the dehydration plant is controlled to suit seasonal changes with consequent savings in plant operation.

As stated before, it was desired to extract only those hydrocarbons in the dehydration plant which would have been condensed in the pipe line drips. This has been done quite satisfactorily by maintaining the dew point at or slightly below ground temperature.

A summary of operating data at this plant follows:

Gas treated to date	15,654,998 M.c.f.
Aerage gas pressure	257 lbs. per sq. in. ga.
Average inlet gas temperature	60° F.
Average outlet gas dew point	39° F.

"Line T" Dehydration Plant, Using Calcium Chloride Glycerin Solution

Gas deliveries through the Cobb compressor station were of such magnitude and character as to require the installation of a dehydration plant. This plant, to be placed at the outlet of a natural gasoline recovering station, designed to remove water vapor only. A study of processes to remove water indicated that several different solutions were available. None of the known processes had been proven sufficiently to indicate a definite advantage.

This plant was designed so that any known dehydrating solution could be used with a minimum of changes in plant equipment.

The design, engineering and construction of a plant having a capacity sufficient to treat 85 million standard cubic feet per 24 hours of natural gas at a pressure of from 250 to 325 pounds and an average inlet gas temperature of 75° F. was contracted for. This plant was placed in operation on December 2, 1937.

Line walker reports showed that the quantity

A. P. I.—Paper presented before annual meeting of the Eastern District, Production Division, Pittsburgh, April 4, 1939

of fluid blown from drips steadily decreased following the start of operations. In approximately one month the line was reported to be commercially dry.

Following is a description of the operation of the plant:

Gas flow.

Natural gas from the gasoline recovery absorbers is delivered to parallel multistage contactors. The gas enters the liquid separating chambers in the lower portion of the contactors where entrained liquids are removed from the gas and drained to a sump. The gas passes upwards through baffles and a series of contactor trays where it is brought into intimate contact with the solution. The treated gas passes through final entrainment separators to the main line.

Solution flow.

Fresh solution at the desired contacting strength (approximately 40 per cent calcium chloride, 20 per cent glycerin and 40 per cent water) is pumped from a solution storage tank at the rate of 5 gallons per minute through a heat exchanger where it gives up its heat to a cold solution from the contactor. From there it passes on through a water cooler into the top stage of the contactor and down the three contacting stages, from the contactor to a surge tank. From here, it passes into the solution to solution heat exchanger and through a steam preheater into the fractionating column. It continues down through the column bubble trays, flowing counter current to the gas as it flows through the traps. The solution then passes into a reboiler where it is heated by means of a steam coil. The revivified solution passes into the storage section.

Revivification.

The principal features of this plant are twofold. First, the commercial use of this solution had heretofore been considered impractical due to the decomposition of the glycerin at the high temperatures necessary to revivify the solution. However, in this plant excess water is stripped from the solution by contact with a small quantity of low pressure high temperature gas. This is converse to the main plant function of removing water from the gas by contact of high pressure low temperature gas with low temperature solution. Solution temperatures required for this stripping gas method of reconcentration are sufficiently low to prevent glycerin decomposition. To date there has been no indication of such decomposition. The revivification is accomplished in the following manner.

Treated gas from the outlet of the dehydration plant is reduced in pressure through a series of regulators from line pressure to 3 pounds. This gas bubbles through the hot solution in the revivifying boiler into the fractionating column, through the bubble cap trays, through a water condensor where the water, stripped from the solution, is condensed, collected and measured, the gas passing into the compressor station fuel system.

The second feature is the use of a contactor tower utilizing the principle of intra-stage solution contacting. This type absorber has been used for some years in the scrubbing and cleaning of gas. The solution circulation within each stage of contact with the gas is at a rate of approximately 200 gallons per minute whereas the solution flow to and from the contactors is only five gallons per minute with consequent saving in pump horsepower and line sizes. Experience at this plant to date has indicated that this type of contractor is highly satisfactory.

The theoretical or equilibrium dew points as indicated by certain solution strengths and contacting temperatures are checked by means of a Bureau of Mines dew point instrument.

Operating difficulties at this plant have been negligible. The one exception was encountered in the fall of 1938 when a thick heavy foam appeared in the solution. This foam disrupted smooth operation by generally clogging lines and controls. Investigation indicated that gas from a new field contained small amounts of hydrogen sulfide which was reacting in the pipe lines to form iron sulfide. This compound was emulsifying with a small quantity of mineral seal oil, carryover from the drying plant, causing the foam.

Steps are being taken to effect a permanent remedy for this foaming by removing the hydrogen sulfide from the gas. In the meantime, temporary relief has been obtained by the manipulation of certain vent and blowoff lines.

A summary of operating data at this plant follows:

Gas treated to date	17,089,548 M.C.F.
Average gas pressure	300 lbs. per sq. in. ga.
Average inlet gas temperature	74° F.
Average outlet gas dew point	35° F.

Boldman Dehydration Plant, Using Diethylene Glycol Solution

Additional eastern deliveries involving higher gas pressures and increased peak loads through 450 miles of 20-inch line indicated the need of a dehydration plant as an essential to reliability of service.

This line passes through very mountainous country, in some places following the beds of mountain streams, so that low ground temperatures would be encountered.

Conditions encountered in consideration of the installation of this plant were somewhat similar to those of the Line H plant inasmuch as the gas does not pass through a drying plant.

Calculations based upon analyses of the gas indicated that the condensable hydrocarbon dew point at 425 pounds gauge pressure, (the peak line operating pressure), was 20° F. It was felt that this would be safely below the lowest ground temperature and theoretically no gasoline would be deposited in the line. However line walkers had reported collecting small quantities of gasoline from the line at the previous peak line pressure of 380 pounds. In view of this conflicting data it was decided to install a dehydration plant for removing water only with provisions for a refrigeration system for extracting condensable hydrocarbons if later conditions should so warrant.

A contract was awarded for the design, engineering and construction of a plant having capacity to treat 50 million standard cubic feet per 24 hours at from 300 to 425 pounds pressure and an average inlet gas temperature of 65° F. The plant was placed in operation December 6, 1938.

The operating cycle of this plant is very similar to that of the Line T calcium chloride glycerin plant with the exception that no stripping (revivifying) gas is used.

Following is a brief description of average operation:

Gas flow.

Gas from the compressor station aftercoolers enters the bottom compartment of the contactor, passing through primary separators which remove entrained liquid, through three stages of solution contacting, out through tracifiers at the top of the contactor, and into the main line.

Solution flow.

Solution of the desired strength is pumped from the solution storage chamber in the bottom of the still by a vertical triplex pump at a 5-g.p.m. rate through solution to solution heat exchangers, and water cooler, to the top of the contactor, through three stages on contacting, to the surge tank, on through solution to solution heat exchangers, and a preheater, into the still. Hot vapors from the reboiler strip moisture from the foul solution as it passes down the column. At this plant, unlike that at Line T, the revivifying is by means of the heat of live steam. The solution passes from the bottom of the still through the reboiler where it is heated by steam, and back into the solution storage chamber. Vapors from this revivifying process rise through the still, are washed with water reflux, and are condensed in a water condenser, the condensate from which is measured and wasted.

One development from the operation of this plant is that the diethylene glycol solution apparently has an affinity for and absorbs condensable hydrocarbons from the gas stream; an average of 25 gallons per day of a heavy gasoline is collected with the water condensed from the still outlet vapors.

The operation of this plant has been of such short duration that no definite operating data is available at this time.

General

At the present time there are full time operators at each of the dehydration plants, the expense of which is by far the largest item of operating cost. It is felt that by correlating control equipment with an alarm system connected to adjacent compressor stations, two of these plants can be made fully automatic and will not require the services of operators. A substantial reduction in dehydration costs will occur.

Neither the Line H nor Line T plants have operated during the summer months; gas loads and ground temperatures being of such nature that the small amount of summer line condensate does not materially affect line capacities. These plants are started in the fall in time to allow for drying the summer condensate collections. . . . It is not absolutely essential that we know the actual dew point of the gas leaving the plant. However a practical means of determining the dew point of the gas as it leaves the dehydration plant would be conducive to economical efficient dehydration plant operation. This information would be essential in comparing the operation of different processes and types of plants.

Several dew point instruments were tested and investigated. To date the only practical and efficient method of obtaining dew points is by the instrument developed by W. M. Deaton of the Bureau of Mines, Amarillo, Texas. This instrument is practical for field operation and apparently presents accurate results.

The diethylene glycol plant has not operated a sufficient time to fully judge results. It is felt that experience with these three plants indicates that each type has its particular application in natural gas dehydration.

Three years' operation of the refrigerated calcium chloride plant definitely indicates that this type of plant is highly satisfactory as a means of removing only those hydrocarbons which would otherwise be condensed in the line. Any desired dew point depression within practical limits may be obtained with this type of plant by installing in connection with it, the necessary refrigeration capacity.

Two years' operation of the calcium chloride glycerin plant shows that this type plant is satisfactory where it is not necessary for the dew point depression to exceed 30-35° F.

Indications to date are that the diethylene glycol process is suitable for obtaining dew point depressions of from 40 to 45° F. It is felt that another year's operation of the diethylene glycol plant will provide sufficient data to compare this process with the calcium chloride glycerin process as to costs and ease of operation.

Three years of experience in the Charleston group of Columbia system has developed the following fundamental advantages in natural gas dehydration:

1. Greater reliability of gas service due to elimination of line freezes.
2. Increased line capacity and subsequent reduction in compressor station horsepower output.
3. Curtailment of gas losses incurred in blowing drips and syphons.
4. Curtailment of line walker personnel.

These points, together with comparatively low dehydration costs, indicates that dehydration should be an integral part of natural gas transmission systems.

Efficiency of Water-Flooding in Important Production

By HARRY M. RYDER
Ryder Scott Co.*

Efficiency, or the lack of it, in any commercial or industrial pursuit may very well be responsible for the difference between success and failure. This is especially true today of water-flooding operations. With crude prices in the Bradford district much lower than when flooding gained its great impetus, and with taxes and other costs mounting, efficient operations become essential if the operator is to be able to show a reasonable profit.

Efficiency as here used concerns itself with the production of the maximum quantity of crude per acre at a minimum cost per barrel. Both of these elements are essential to the greatest success. Any economically recoverable oil left in the ground for any reason results in loss of efficiency just as truly as does higher-than-necessary cost of operation.

The ultimate cost of a flooding operation may be divided into interest, development and operating costs. This total, divided by the number of barrels produced over the life of the flood provides the per barrel figure. To reduce interest, development or operating cost without reducing the amount of oil produced is to directly reduce this cost. To do this and at the same time increase the ultimate production will further reduce the unit cost. This in many cases is entirely practicable.

Development Costs

The ultimate amount of interest paid is controlled by the rate of development, the volume of production and the time in which it is obtained.

The development cost involves principally the drilling and equipping of wells and the construction of a pressure plant and powers. This cost is directly affected by the number of wells provided for any given property and by the amount of water the property must be equipped to handle.

The direct operating expense includes as its more important items labor, supplies and fuel. The labor and supply items will vary more or less in proportion to the number of wells on a given acreage. The fuel item becomes increasingly important in older floods, as the quantity of available gas rapidly diminishes, and as it becomes necessary to handle more and more water. When unnecessarily large quantities of water are handled, all of these costs rise.

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To produce then, the most oil at the lowest unit cost, the following must be carefully considered:

1. Drilling pattern.
2. Well spacing.
3. Water pressure and quality.
4. Completion of wells, with special reference to the directing throughout the life of the flood of all water so far as possible to where it will do useful work.
5. Conservation of gas supplies.
6. Selection of machinery and other equipment to best fit the job.
7. Control of operations to do the work most effectively.

Every one of the items listed enters importantly into the unit cost of a flooding operation, and if this cost is to be kept at a minimum, all must be given careful consideration. For the present purposes, we will limit our discussion to the first four, as these have in common a dependence upon sand conditions.

Consider first the drilling patterns. Of these there are four, the 4-spot, 5-spot, 7-spot and 9-spot, as illustrated in Figure 1. It seems desirable to emphasize that in the water-flooding districts a single pattern is considered as having a producing well at its center, this well having intake wells arranged around it, rather than the reverse, as is sometimes spoken of in gas repressuring areas.

The 5-spot pattern is most widely used, partly because of custom (it is the original all-over pattern) and partly because of simplicity in laying it out and in fitting it into property boundaries.

Muskat has shown from theoretical considerations the 4-spot or 7-spot to be somewhat more efficient as to recovery than the 5-spot, that is, other things being equal, more oil per acre can be recovered if the 4-spot or 7-spot pattern is used. Practical considerations lead us to the same conclusion.

Fluid Movement

Numerous field and laboratory tests indicate that water will drive oil through sand far more easily than oil will drive water. We must conclude therefore that in any particular sand stratum (and many pay sand bodies are technically a series of practically disconnected strata), if and when water reaches and surrounds a producing well, additional oil can reach the well from other directions only with great difficulty, if at all. The greater the ratio of longest to shortest paths, then, the greater the chance of trapping oil. From this and other considerations we conclude that the nearer this ratio is to unity, the more efficient the flood is likely to be, other things being equal. This favors the 4-spot or 7-spot flood.

Again, throughout the life of the flood, more liquid enters the intakes than is pumped from the producing wells, the difference finding lodgment in the previously nonliquid-saturated pore space. Theoretically, for this reason, more intake wells should be provided than producers. Actually, in open sands this matter may not be so important. In tight sands it may become essential to good operation.

For some months after water is first introduced into a sand body no increase in oil production is accomplished. The shorter this period, the sooner the economic benefit of the flood will begin to accrue, and the shorter the period that interest must be charged on the investment. The waiting period may be shortened in three ways, by heavier shooting, by using higher pressures, and by increasing the number of intake wells in a given acreage. Of shooting and pressures, more later.

The number of intakes may be increased by reducing the well spacing, or by proper selection of pattern. Disregarding boundaries, and assum-

*Author's title: "Practical Water-Flooding Efficiency in Oil Production."

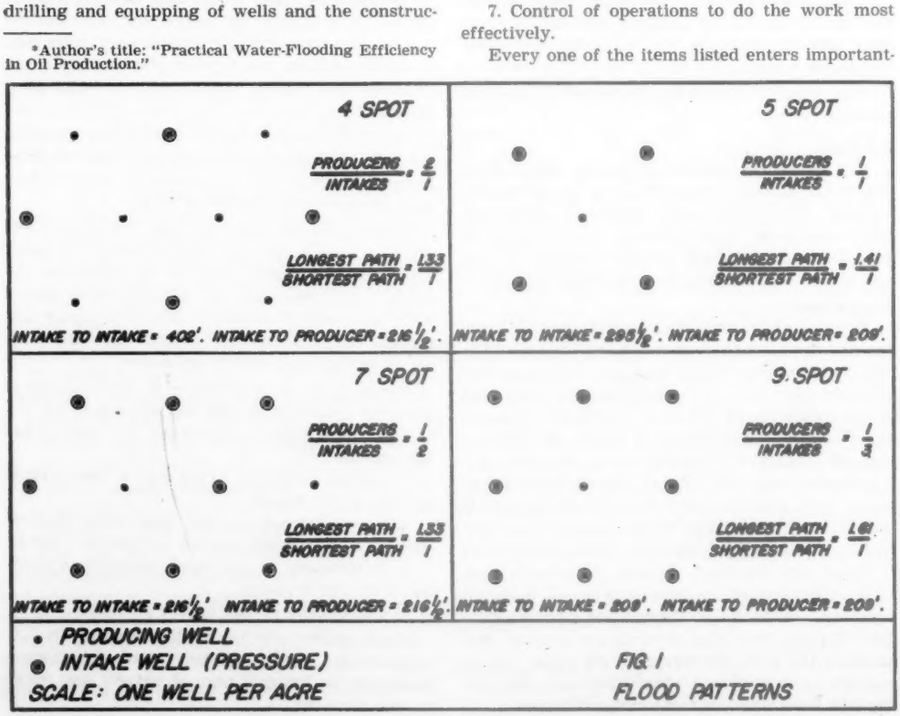
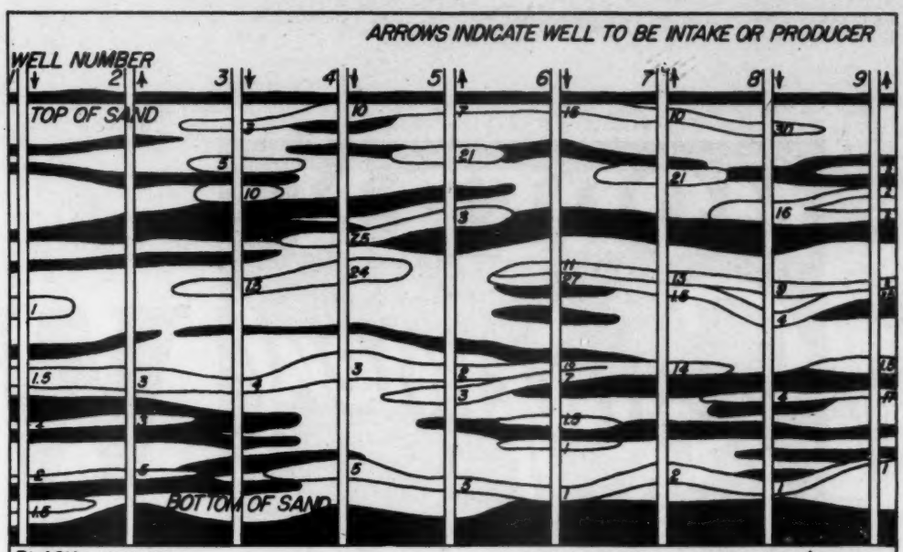

4 SPOT
PRODUCERS / INTAKES = 2/1
LONGEST PATH / SHORTEST PATH = 1.33/1
INTAKE TO INTAKE = 402'. INTAKE TO PRODUCER = 216½'.
5 SPOT
PRODUCERS / INTAKES = 1/1
LONGEST PATH / SHORTEST PATH = 1.41/1
INTAKE TO INTAKE = 295½'. INTAKE TO PRODUCER = 209'.
7 SPOT
PRODUCERS / INTAKES = 1/2
LONGEST PATH / SHORTEST PATH = 1.33/1
INTAKE TO INTAKE = 216½'. INTAKE TO PRODUCER = 216½'.
9 SPOT
PRODUCERS / INTAKES = 1/3
LONGEST PATH / SHORTEST PATH = 1.61/1
INTAKE TO INTAKE = 209'. INTAKE TO PRODUCER = 209'.
• PRODUCING WELL
◉ INTAKE WELL (PRESSURE)
SCALE: ONE WELL PER ACRE

FIG. 1
FLOOD PATTERNS

Bradford Problem



BLACK - SHALE
LENSES - "OPEN" SAND OF PERMEABILITIES SHOWN
REMAINDER OF SAND - BELOW .5 MILLIDARCY

FIG. 2. ACTUAL SECTION, 1600' LONG, OF A TIGHT AND BROKEN BRADFORD SAND BODY 90' THICK

ing one well to the acre, in a 100-acre property a 4-spot would provide 33 intakes, a 5-spot 50 intakes, and a 7-spot 67 intakes. We can, then, to a considerable extent, control the waiting period and the speed of flooding by our selection of pattern. In a sand body of high permeability, this factor may not be especially prominent. In a tight sand, however, this consideration may make the difference between a desirable or profitless operation. For territory of the latter type, therefore, the 7-spot pattern is in abstract strongly indicated.

The 9-spot pattern is an irregular arrangement and is undesirable from the viewpoint of the ratio of longest to shortest paths. Its greatest use lies in its development from a previously drilled 5-spot where shorter spacing is desired.

The selection of well spacing has a very strong bearing on development cost. In the Bradford area a well may cost $2,500. One acre may be capable of supplying 3,500 bbls. of oil. If one well is drilled to each one and one-fourth acres, the well cost per barrel will be about 57 cents. If, on the other hand, one well is drilled on each three-fourths acre, the corresponding cost will be about 95 cents. The difference between these would make a satisfactory net profit on any operation. Yet the closer spacing is sometimes used where the greater spacing would be just as effective.

The most efficient spacing for any property can be determined only in the light of a knowledge of the particular sand properties and of the present and prospective economic conditions, including crude prices, labor and material costs, etc. A sand body of very low permeability will require closer spacing than a high permeability sand. Also it may be important to space wells closer in a very irregular sand body than would be justified where the sand is uniformly continuous, due to the danger of trapping oil in the blind ends of lenses.

Well Spacing

The time required to deplete an area, using any particular pattern will vary roughly as the square of the spacing, since the number of wells introducing water will decrease in this ratio. By changing to a pattern providing more intake wells in proportion to oil wells, this can be in part compensated for. It can often be compensated for in addition by the adjustment of pressures.

There is, therefore, no best spacing for all properties, as the maximum (and therefore lowest development cost per barrel) spacing may result in too slow a return and too high total interest charges. The amount of money available for development also has its influence.

The application of pressure to water costs money, both in capital investment and in operating expense, and the higher the pressure, the greater these costs. On the other hand, the higher the pressure, the fewer wells will need to be provided for the introduction of a given amount of water into a property; or, for a given number of wells, the quicker the oil will be produced and the investment returned. Also, all laboratory work and some field work as well indicate specifically that the higher pressures remove a larger percentage of oil from the sand.

The highest pressure it is possible to use on any sand body is, at the surface, about equal in pounds per square inch to the depth to the top of the sand in feet. Beyond this, the pressure may cause and has caused the overburden to be raised sufficiently to enable water to by-pass the sand itself. Aside from this there is no theoretical reason, nor competent evidence, that water channels the sand in any way. In other words, the weight of the overburden determines the theoretically highest pressures to use.

It is obvious that roughly to introduce a given amount of water into a foot of sand, the pressure required will vary inversely proportional to the permeability, other things being equal, that is, that a high permeability sand will handle the same amount of water at a relatively low pressure that will require a high pressure should the permeability be low. Since the whole economic as well as technical picture enters, it is not possible to write a simple formula for pressure determination. Each property must be worked out on its own merits. This can for all practical purposes be done.

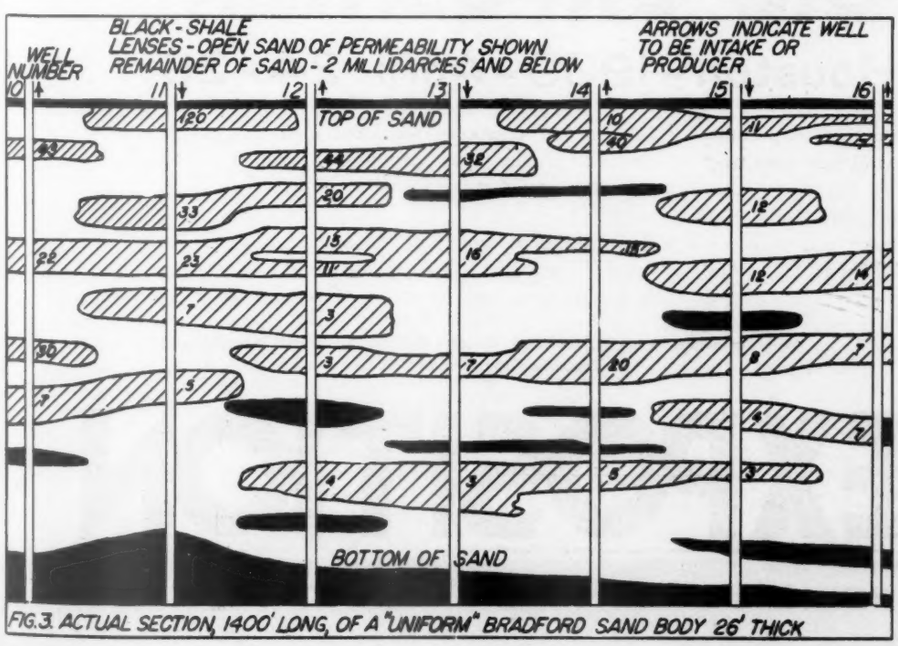


FIG. 3. ACTUAL SECTION, 1400' LONG, OF A "UNIFORM" BRADFORD SAND BODY 26' THICK

Quality of Water

The quality of the water used is as important a factor in efficient operation as is the quantity. Flood water must contain nothing which will tend to plug the very small pores in the sand. Further, its nature must be such that it will not excessively corrode the pipe lines through which it passes.[1] Fortunately a high quality of water is generally so simply and economically attainable as to represent no serious operating problem.

It seems self-evident that to attain efficiency, as much of the water as possible must be made to do useful work, that is, must move oil toward and into the producing well. It is also evident that any water reaching a producing well without moving oil ahead of it, that is, through "watered-out strata" is not doing useful work and is therefore lowering the efficiency of the operation.

If one stratum "waters out" ahead of the others, water will henceforth travel through it to no useful purpose. The problem therefore is to

[1]Proper Treatment of Flooding Water, Harry M. Ryder, Producers Monthly, Sept., 1937, Vol. 1, No. 11. Water for Oil Well Flooding Operations, Harlan W. Nelson, Producers Monthly, February, 1938, Vol. 2, No. 4.

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maintain the flood "front" as regular and nearly vertical at all times as is possible in the heterogeneous assortment of sand strata that usually go to make up the sand body.

Figure 2 illustrates a rather bad, but by no means unusual actual case of this heterogeneity in the Bradford field. Most of the sand on this property is less than one-half millidarcy, yet can be profitably flooded if properly handled. There will in this case be some inescapable trapping of oil in blind lenses, as for instance in the lower three millidarcy lens near the bottom of well No. 2. The 21 millidarcy lens in well No. 5 will not be flooded in the plane of the sketch.

Figure 3 illustrates a similar type of section of what has been considered a much better, and in fact a very uniform sand. The presence of the high permeability lenses, or "open streaks" was not seriously suspected prior to the sand examination. Here only a few small isolated lenses of shale occur. A similar section plotted at right angles to Figure 2 indicates that these open sand lenses in general are longer in the northeast-southwest direction than in the northwest-southeast direction, although certain ones, the 120 millidarcy lens in well No. 13, for instance, lie almost at right angles to the general trend.

It is obvious that with uniformly shot wells, and with a uniform pressure applied to the entire sand body, the water will not progress simultaneous at a uniform velocity in all strata. The water will move with various greater speeds through the higher permeability lenses than it will through the tighter parts of the sand body. Under these conditions it will of necessity reach the producing wells through the open lenses long before the water moving through the tighter sand. As soon as water reaches the producing well through any particular lens, that lens may be considered to be watered out. Water will henceforth continue to move through this lens throughout the remaining life of the property, and will be doing no useful work. At the same time it will cost money to drive this water in and to pump it out again. In certain cases, such as a protracted breakdown of the producing well, it may in addition do serious damage, by causing a reverse flood to be developed in that producing well.[2]

As it would be utterly impractical to correct for this sand condition by the placing of multiple packers and multiple strings of tubing to enable varying pressures to be applied, the only recourse left to us in the control of the shooting of the well. Only in this manner can the nitroglycerin, an expensive material, be placed where it will do most good, and where, so far as practicable the varying permeabilities found in each well can be compensated for by varying the effective diameters of the well at the positions concerned.

In Figure 4 we have attempted to illustrate the position of the flood front in the sand body disclosed in Figure 3, at a time about 18 months after water has been simultaneously introduced into the three intake wells shown, as if uniformly shot with 3½-inch shells, and at a uniform pressure for all of them, perhaps in this case 650 pounds per square inch at the surface.

It is inevitable, in a computation of this sort, that many approximations must be made. There are many known minor variations in the permeability in each well which, for this purpose, it would be out of the question to consider. And further there are innumerable minor, and perhaps many major unknown variations in permeability between the wells to which no consideration can be given. Again, the variations which undoubtedly occur in the third dimension, at right angles to the sketch, must enter to an unknown degree.

The varying oil saturation of the sand will also enter and can only partially be included in the mathematically development.

[2]S. T. Yuster, Producers Monthly, Vol. 2, No. 9, July, 1938.

To correct for uncertain conditions so far as possible, the relationships between permeability and rate of flow and between shot strength and rate of flow as determined from extended field data and presented by the writer in a previous paper[3] have been used in the present instance. As the flood in this case is being developed on a 5-spot pattern, the pressure gradient computed by Dr. S. T. Yuster[4] has been used.

In spite of the infinitely complex system with which we are working, it would seem that the position and profile of the flood front as shown in Figure 4 will give us an excellent idea of how floods actually do move through a sand body which has been in the past placed under the category of "uniform."

In examining this sketch we notice first of all that far more water has entered well No. 11 than well No. 15. Also that wells Nos. 10 and 12 are producing considerable quantities of water, which is costing money and is doing no work. Well No. 14 is producing water, but in smaller volume, and well No. 16 is producing no water at all from the intakes shown. Water which these producing wells may be "making" from the intakes placed back of and in front of the row here shown, is of course not included in this examination.

Further, we see where this water comes from and how it happens to be where it is. Previously unexplained variations from well to well in the behavior of both intakes and producers become understandable.

And what is most important of all, we know what to do about it. Every barrel of water produced means that one or more barrels is entering an intake well and will do no useful work. hence increasing costs and lowering efficiency.

The obvious solution to this problem is to so arrange matters:

1. That so far as possible the same amount of water will enter each vertical foot of sand body at the same rate, irrespective of permeability, and in this way assure a uniform and vertical flood front.

2. As to speed up the naturally slow movement of water through the tighter sand, hence bringing to the surface its recoverable oil at an earlier date.

3. At the same time the movement of water into the higher permeability lenses is retarded slowing up the recovery of oil from these somewhat, but retarding the entrance of large quantities of water which if permitted would pass through the sand without doing useful work.

The instrumentality of this control is the nitroglycerin used to shoot the well. A 5½-inch diameter shell (4½ quarts per foot) will fracture (not cave) the sand far deeper than a 3½-inch shell (2 quarts per foot) and hence enable far more water to enter the sand under a given pressure than if the lighter shot were to be used. Please notice that here we make no reference to the total quarts in the shot, nor to the length of the shells. The diameter of the shell, and hence the intensity of the shot determines the extent of useful fracturing.

It is true that the total amount of glycerin in the shot does have some effect on the results to be obtained from any given diameter of shell. This effect is probably minor, and since the size of the total shot must necessarily be the total of the individually determined shells, it can and needs to be considered only in a general qualitative manner.

Each of the wells shown in Figure 4 has in fact, in this manner, been shot using shells of various diameters, and at places using spacers, in accordance with the exact nature of the sand as found by test in each well. The flood front for the same pressure and elapsed time has again

[3]Petroleum and Natural Gas Conference, Pennsylvania State College, April, 1937.

[4]S. T. Yuster, Producers Monthly, Vol. 2, No. 9, July, 1938.

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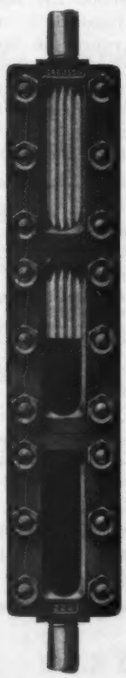

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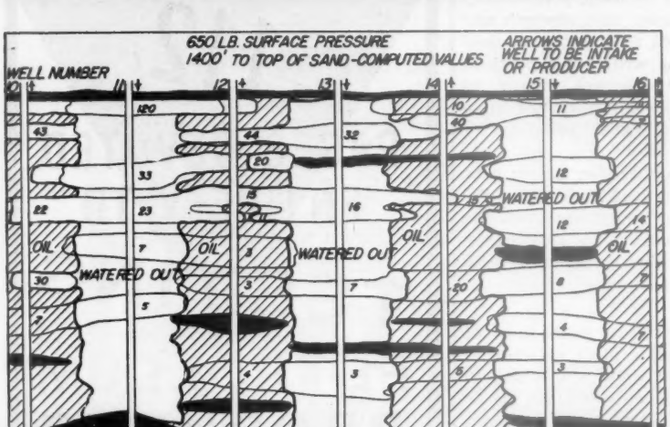


FIG. 4 SAND OF FIG. 3 SHOWING FLOOD POSITION, 18 MONTHS - UNIFORM SHOT 3½" SHELLS

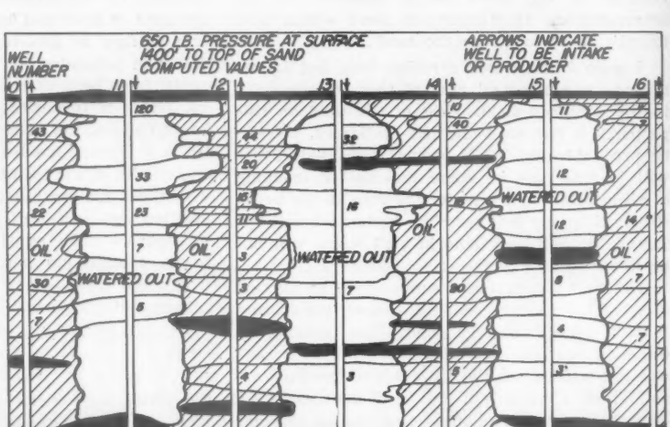


FIG. 5. SAND OF FIG. 3 SHOWING FLOOD POSITION, 18 MONTHS - CORRECTIVE SHOOTING

been computed in the same manner as before and the results plotted on Figure 5.

Change in Profile

A comparison of the two charts shows the striking change which has taken place in the flood front profile. There are no longer any arms of water reaching out to embrace the producing wells. At the same time the flood front in most of the tight sand has advanced much further than it had in Figure 4. In fact somewhat more than twice as much water has entered most of the tight sand than where the uniform shot was used.

It is true that the flood front is not yet a straight line. We should like to accomplish just this, but the erratic natural placement of the open lenses require that a compromise be reached from practical considerations. For this reason, where a narrow band of tight sand is found between two open lenses, it is not always convenient to place a foot or so of a 5½-inch shell, for instance. Also, there are minor permeability variations in the sand at the wells which have been omitted from this presentation for purposes of simplicity. But a practical correction has been accomplished, which has been handled in the field in a practical manner. Of course, in time water will reach the producing wells through same of the strata ahead of the others. Just the unknown variations in the sand between wells would accomplish this. All we can do, and this we have done, is to make the major correction.

This gives us very valuable operating advantages:

1. The distribution of water throughout the sand body is rendered far more uniform because of the corrective shooting.

2. The flood front in the tightest sand is advancing roughly twice as fast as it otherwise would, bringing in oil from this very considerable portion of the sand body in a much shorter time.

3. The advent of any large quantity of water to the producing wells is greatly delayed.

4. The total final introduction and production of water is enormously reduced.

Water Handled

To reduce these considerations to numerical values on a theoretical basis is exceedingly difficult, and in most cases would require so many unsupported assumptions as to be of doubtful value. An approach to this end has been made, however, in the case of the water handled, and is summarized in the following table:

	Intake wells—Amount of water input		
Computed first 18 mos.—	No. 11	No. 13	No. 15
Total bbls. uniform shot	34,200	26,200	22,800
Total bbls. corrected shot	21,500	21,200	22,200
Av. bbls./day uniform shot	62.5	47.9	41.8
Av. bbls./day cor. shot	39.4	38.7	40.4
Estimated 6½ years—			
Total bbls. uniform shot	110,900	84,700	75,700
Total bbls. corrected shot	70,800	66,900	72,400
Saving in water, bbls.	40,100	17,800	3,300

	Producing wells—Amount of water produced coming from above wells only			
Computed first 18 mos.—	No. 10	No. 12	No. 14	No. 16
Total bbls. uniform shot	370	896	37	0
Total bbls. corrected shot	0	0	0	0
Av. bbls./day from beginning, uncorrected shot	1.8	2.3	.32	0
Approx. time first appearance, uncorrected shot	1 yr.	6 mos.	15 mos.	2 yrs.

It will be noted that in the case of intake wells Nos. 11 and 13 a very large saving of water is effected by the corrective shot, in addition to the speeding up of the flood movement in the tight sand. As all of the excess water would be uselessly supplied, and a considerable portion of it would be pumped again from the producing wells, the saving in water handling costs will run into thousands of dollars. The dollar advantage in the speeding up of the flood movement in the tight sand and in the tighter of the charted lenses is far more difficult to compute but will greatly exceed the saving in water handling.

Another saving will arise from the lighter duty (water) requirements of the well pumps. Since these will not be required to handle so much fluid, there will be less pulling and other maintenance costs.

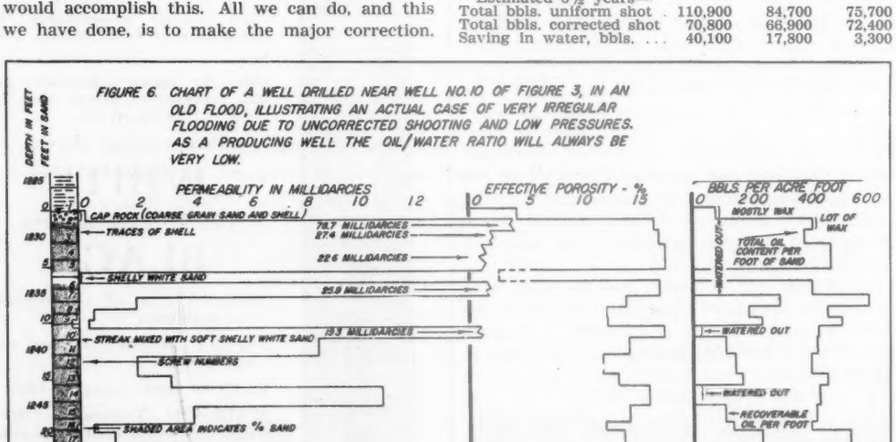
In Development Stage

The particular operation discussed here is still in the development stage (all wells here considered have of course been completed) so that it is not possible as yet to verify the figures here given from actual operation. Well No. 17, shown in Figure 6 in technical profile, was drilled into an old subsurface flood on this same property. The effect of selective watering out of the more permeable strata, due to uniform shooting and low pressure, is excellently exhibited here. All "open streaks" are watered out. Oil concentration, due to approaching pressure water, is found at 1,236 feet and 1,248 feet. The remainder of the sand has been unaffected by the flood. Approximately 4,000 bbls. of oil per acre are normally recoverable from this area.

In the case of the property which includes the wells shown in Figure 2, early developments have been producing for 10 years beside developments of recent years involving corrective shooting.

In this case the contrast in the two modes of operation is very great. The early operation (uniform shooting) from a very early date involved 24-hour pumping in order to handle the water, and now after 10 years it is necessary to produce 20 bbls. of water to get in some cases less than half a barrel of oil. Also the amount of water entering the producing well is so great that an extended suspension of pumping would seriously endanger the remaining producible oil by head-

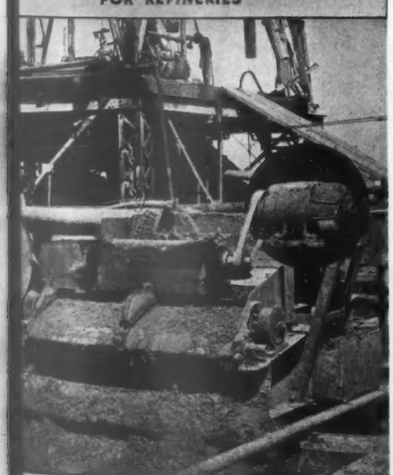
FIGURE 6. CHART OF A WELL DRILLED NEAR WELL NO. 10 OF FIGURE 3, IN AN OLD FLOOD, ILLUSTRATING AN ACTUAL CASE OF VERY IRREGULAR FLOODING DUE TO UNCORRECTED SHOOTING AND LOW PRESSURES. AS A PRODUCING WELL THE OIL/WATER RATIO WILL ALWAYS BE VERY LOW.


DEPTH IN FEET
FEET IN SAND
PERMEABILITY IN MILLIDARCIES
EFFECTIVE POROSITY - %
BBLS. PER ACRE FOOT
CAP ROCK (COARSE GRAIN SAND AND SHELL)
TRACES OF SHELL
SHELLY WHITE SAND
STREAK MIXED WITH SOFT SHELLY WHITE SAND
SCREW NUMBERS
SHADED AREA INDICATES % SAND
WHITE SAND
GRAYISH BROWN SAND
BROKEN WITH SHALEY GRAY SAND
NOT TESTED
MOSTLY WAX
LOT OF WAX
TOTAL OIL CONTENT PER FOOT OF SAND
WATERED OUT
RECOVERABLE OIL PER FOOT
AT THIS WELL:
TOTAL OIL CONTENT ABOVE 1256½' 11,200 BBLS. PER ACRE
RECOVERABLE OIL ABOVE 1256½' 2,250 BBLS. PER ACRE
BY FLOODING ALL PAY FORMATIONS

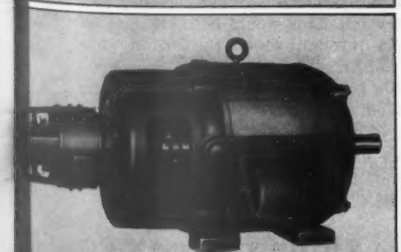
TURY SQUIRREL CAGE MOTORS
FOR GENERAL PURPOSE APPLICATIONS

NTURY SPLASH PROOF MOTORS
FOR OUTDOOR INSTALLATIONS

TURY EXPLOSION PROOF MOTORS
FOR REFINERIES



NTURY SPLASH PROOF MOTORS
FOR MUD SCREENS



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THIS Century MOTOR ABSORBS SHOCKS-INCREASES LIFE OF THESE PUMPING UNITS . . . .

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3 Greater starting efficiency — more starting torque with less starting current than is secured from "general purpose" motors.

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ing up and forming a back pressure of water on the present pay sand.

In contrast with this, the wells completed by corrective shooting show a very small water production, and far more oil. The pumping time on these wells, varying with the individual well, is from two to five hours a day, and the indicated total recovery will be greater by one or more thousand barrels for each well.

A shot simply cannot be competently selected when the individual sand characteristics are unknown. Any reasonable shot will of course greatly improve the performance of the well, but only one shot, selected and tailored for the well in question will do the job efficiently, will enable the operator to get the most for his money and effort.

The cost of gaining the necessary knowledge of the sand in order to properly choose pattern, spacing, pressure and shot for an efficient operation is moderate, and very small in proportion to the advantage to be gained by its use.

Chip sampling of the sand,[5] as introduced by D. T. Andrus of Bradford has become a very practical everyday procedure from which all necessary exceedingly accurate information of sand conditions can be quickly and economically obtained. Within several days of the drilling of the sand, information can usually be available for specifying a proper shot for the sand as it is actually found.

Today, therefore, the most efficient drilling patterns, well spacing and pressures cannot be determined without an exact knowledge of the character of the particular sand body involved, nor can efficient control of the flood be obtained without an accurate knowledge of the particular sand condition existing in each well. With this information, now available as a routine procedure, efficient flooding is at last a practical reality. Guesswork as to what goes on in the sand can be a thing of the past.

[5]Harry M. Ryder and Donald T. May, The Oil and Gas Journal, April 21, 1938.

SAFETY — Lines on Automatic Spooler

One of the many advantages of the modern drilling hoist is the high speed attained by the drum shaft while spooling the drilling line; newer type rigs have drum speeds exceeding 200 r.p.m. and can spool nearly 2,000 feet of line per minute. When 1⅛-inch line is being spooled at this rate it is essential that it be placed on the drum evenly, but the increase in speed makes this much harder to accomplish as the whip in the line becomes greater.

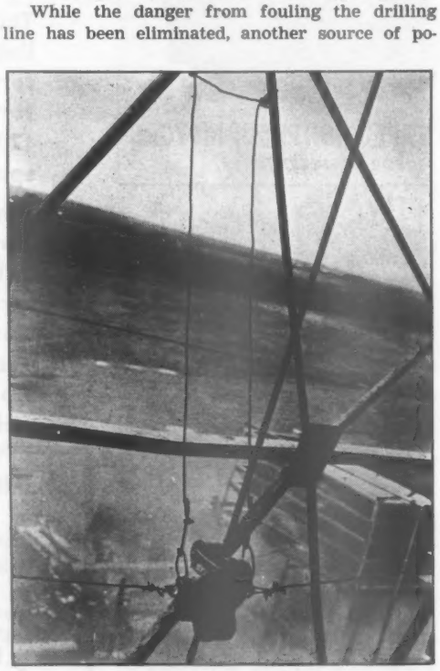
When going in the hole, the line is spooled with only the weight of the blocks, hook and elevators to hold it steady. This is also the time when the line is being spooled the fastest and the line frequently overlaps or balls on the drum.

The overlapping of a line on the drum causes excessive wear and causes the outer layer of the drilling line to break and become full of "wickers." There is also a very definite danger from fires while completing a well as the overlapping causes sparks.

The balling on the drum is even a greater source of danger because the line can become so badly fouled it will not unspool, particularly if the pipe is lowered rapidly. This means that the turning of the drum will be stopped quicker and with a harder jerk than it is possible to impart with a most vigorous application of the brake. With a heavy load, a drilling line may snap under the sudden strain. Careful drillers generally inspect the line on the drum and if there is any indication of improper spooling they will lower the drill pipe at a snail's pace rather than risk parting the line.

Safety and economy demand that some method be used to prevent whipping in the line while it is being spooled under a light load; the line guide has been developed for this purpose. Drillers originally used a rotary chain link through which the drilling line was run and to each end of which was attached a wire cable. A heavy weight, generally a pump liner filled with concrete, was attached to the end of these lines after running them through a hay pulley attached to the derrick girt. The patented spooling device shown in the photograph replaces the crude chain but the general method is still the same, the inerta lag of the weights preventing excessive whip of the line. A variation of this method eliminates the weights by attaching the free ends of the line to the line spooler after passing them through a pulley located above and the two side pulleys. Strain on the spooling device is adjustable through a turnbuckle on the upper pulley.

While the danger from fouling the drilling line has been eliminated, another source of potential injury has been introduced. There is always the possibility that the guide lines may part or a hay-pulley fail. This would be disastrous because the part through which the drilling line runs could fall into the drum and a general shambles would result with a great deal of danger to the workmen.



On this installation, the manufacturer of the spooling device has provided extra loops to which additional lines, fastened to the derrick braces, can be attached.

QUESTIONS ON TECHNOLOGY

By Charles K. Francis, Ph. D., Technical Editor

Rust-Hole Time Performance Curve or Formula for Pipe Lines

What is the meaning of a rust-forming formula as applied to pipe lines? I am informed that this formula has been arranged for predicting the extent of corrosion for some years in advance.—W. K. S.

A study of the conditions of pipe lines by W. F. Rogers revealed that if the cumulative rust holes are plotted against time (years) in place on log-log paper, the resulting curve consists of one to several broken lines. From such curves it is possible to extrapolate a corrosion-history curve for at least two years, enabling a determination to be made two years ahead of time of the number of rust holes which will appear. Also, these curves may be used to determine pitting rates of soils as a whole.

This relation between rust holes and time is expressed by the formula:

$$R = bT^n$$

where

R = cumulative rust holes
T = time, in years
b = the intercept of the curve on the R axis, which is the value of R when T is one year
n = slope of the curve

For this particular line the value of $n = 4.7$ and $b = 0.000035$. The constant value of 4.7 for the slope shows that the number of rust holes increased year by year. The annual increase in rust holes in this line finally became so great that it was necessary to abandon it.

Another illustration is of 30.5 miles of 8-inch line, representing an average pipe-line history. The rust-hole record over 30 years of service forms a curve which is broken into four slopes. The first has a value of 4.7, and last for two and one-half years. The second has a value of 1.4, and lasts for four years and 31 rust holes. During the last year of this slope 2,900 feet of pipe were repaired. The next year the line assumed a third slope, with a value of 3.3—indicating an increased rate of rust-hole occurrence. This slope of 3.3 continued for seven years. Since that time the slope changed back to a fourth value of 1.4.

Data are presented in the original paper giving the history of several pipe lines on the basis of rust holes.

Reference: Walter F. Rogers, The Use of Rust-Hole Records to Study Pipe Service, Amer. Pet. Inst., Chicago, Nov. 18, 1938.

Dyes for Artificial Coloring of Motor Gasoline

We wish to obtain a list of the dyes suitable for coloring gasoline. Can you furnish the names of the dyes that will give good red, blue, yellow, and green? If you have reports of tests showing how these stand up when exposed to sunlight, we would like to have them.—L. A.

There are a large number of dyes used for the coloring of motor gasoline. Many dyes do not give the color when added to gasoline that the name indicates. Some reds produce an orange color, blues a green or brown, the greens a brown, blue and possibly yellow. Egloff, Morrell and Truesdell have made a study of the behavior of a large number of all soluble dyes. The properties of those mentioned here are as reported by them.

Name—	Color	Straightrun and cracked gasoline: Fading time, hours	Lbs./1,000 bbls. required: Cracked gasoline	Straight-run gasoline
Oil red No. 1 conc.	Red	+56	1.23	1.47
Oil red 0	Red	+50	.91	1.25
Alizarin blue AS	Blue	+50	1.35	1.40
Oil blue MG	Blue	+50	3.50	2.45
Oil yellow AX	Yellow	+50	4.90	7.50
Oil yellow No. 2	Yellow	+50	7.50	7.50
Alizarin cyan. green-3G	Green	+50	2.25	1.64
Gaso green No. 2737	Green	+53	.42	.42
Oil orange No. 30	Orange	+50	1.33	1.37
Oil orange X conc.	Orange	+50	1.40	1.40

Some coloring of gasoline is done to neutralize the very faint yellowish tint natural to gasoline. Very small quantities of the oil soluble blue dyes are used for this purpose. The principle is the same as the action of blueing when laundering white textiles.

The authors state that the total sunlight for each sample was eight hours per day during August and September. The total exposure period was 56 hours, including darkness, so if there was no change at the end of this time, the dyed samples were considered stable and marked +56 or +50 as the fading time.

Reference: Egloff, Morrell and Truesdell, The Oil and Gas Journal, March 5, 1931, p. 133.

Questions on Petroleum Technology may be sent to Dr. Charles K. Francis, The Oil and Gas Journal, Tulsa, Okla. When a copy of the answer is desired, postage should be included.

INDEX

CHEMICALS FOR THE PETROLEUM INDUSTRY SPECIFICATIONS

D

Chemical	Issue Date
Dibenzyl-Para-Aminophenol	July 8 1937
Dichlorethyl Ether (Chlorex)	January 6 1938
Diethylene Glycol	December 2 1937
Diethylene Glycol Monoethyl Ether	March 9 1939
Diphenyloxide	February 24 1938
Disodium Phosphate	October 13 1938

E

Ethanol (Ethyl Alcohol)	December 16 1937
Ethyl Benzene	February 2 1939
Ethyl Chloride	April 7 1938
Ethyl Ether	December 30 1937
Ethylene Dichloride	November 18 1937
Ethylene Glycol	January 27 1938
Ethylene Glycol Monomethyl Ether	March 3 1938

F

Ferric Chloride	September 22 1938
Ferrous Sulfate	December 15 1938
Furfural	April 22 1937

Average Weights Per Gallon of Gasoline Sold in the United States

What is the average weight per gallon of each grade of gasoline sold in the United States? Also, the same information for lubricating oils?—W. C. S.

In the U. S. Bureau of Mines Cooperative Fuel Research Motor Gasoline Survey, Summer 1938, E. C. Lane has compiled data covering 54 brands of motor gasoline, represented by over 1,480 samples collected during the summer of 1938, which includes average gravities. These are regular-price gasoline 59.8° A.P.I., premium-price gasoline 60.4° A.P.I., third-grade gasoline 59.8° A.P.I. The averages represent the mean obtained from the sum of the average gravities for all districts and are therefore not weighted either on the basis of samples per district or volume marketed.

The summary of the data of the survey, Table 5, gives the following range of gravities A.P.I. for each grade.

Regular, minimum 55.6, maximum 63.1.
Premium, minimum 51.7, maximum 66.2.
Third grade, minimum 54.3, maximum 67.1.

WEIGHTS PER GALLON

Grade—	Gravity	Weight per gallon, lbs.
Regular	59.8	6.162
Premium	60.4	6.143
Third	59.8	6.162

Considering the extremes above mentioned from Table 5, there is a variation in weight from 6.435 pounds per gallon (51.7° A.P.I.) to 5.936 pounds per gallon (67.1° A.P.I.).

No data are available from which to attempt to derive an average weight for lubricating oils.

Relation of Barrels and Tons of Petroleum Oils

In all foreign reports of oil consumption, or production, that I have seen, they use tons of oil. How many barrels is a ton of oil?—P. H.

The number of barrels of oil to the ton depends on the specific gravity of the oil. When making approximate estimates 7.3 bbls. per metric ton of 2,204 pounds is often used. However, this relation is supposed to represent oil having an average specific gravity of 0.8602 or 33° A.P.I., which weighs 7.163 pounds per gallon or 300.8 pounds per barrel of 42 U. S. gallons. The more exact equivalents are 7.3281 bbls. per metric ton of 2,204 pounds and 7.4457 bbls. per long ton of 2,240 pounds for oil of this gravity.

Additional conditions to be considered when calculating exact volumes and weights of oil are temperature and the weight of a gallon of water. The standard temperature used in the United States is 60° F.

The weight of a gallon of water multiplied by the specific gravity of oil, or any other liquid, gives the weight of the liquid for the same volume and temperature.

The reference books contain a variety of weights for the gallon of water, including 8.334, 8.4, 8.337, 8.34 and 8.328 pounds. The National Standard Oil Tables of the National Bureau of Standards use 8.328 pounds, which is the authority recognized in the United States. The relations degrees A.P.I., specific gravity at 60° F., and pounds per gallon are given in the National Bureau of Standards Circular C410.

Mid-Continent Refinery Crude Runs Advance During April

Estimated daily crude runs to stills in the Mid-Continent area will advance sharply during April, according to reports from individual companies. With lowered stocks in both gasoline and fuel oil and with the motoring season just opening, increased crude runs are reported generally throughout this area. The total estimated daily runs for April are 523,335 bbls., compared with 497,180 bbls. in March, an increase of 26,155 bbls. daily. The April total, however, is considerably lower than for the same period of one year ago, which was 532,120 bbls.

East Texas Reports Substantial Increase

The greatest gains in crude run to stills are reported in the East Texas area, with a total of 44,075 bbls. daily scheduled to be run in April, compared with 35,675 bbls. in March, an increase of 8,400 bbls. daily. The Talco Asphalt & Refining Co. at Mount Pleasant is again running near capacity with 5,000 bbls. reported for April, compared with 500 bbls. in March. The East Texas Refining Co., Longview, increased its daily runs from 3,200 bbls. to 5,000 bbls.; all other plants showing a general increase in activity.

In Kansas crude runs were up 4,650 bbls. with an estimated total for April of 128,575 bbls., compared with 123,925 bbls. in March. This increase reflects increased activities generally throughout the state.

Crude runs to stills in Oklahoma were increased somewhat compared with the March total, with 149,900 bbls. scheduled to be processed during the month as compared with 145,100 bbls. for last month, a gain of 3,900 bbls. for April. The Barnsdall refinery, at Barnsdall, is again running near capacity with 4,000 bbls. of crude daily being run to stills. Increased runs were general throughout the area with the largest gain reported by the Continental Oil Co. at Ponca City; this plant processing 19,500 bbls. of crude daily, compared with 18,500 bbls. in March. The Ben Franklin Refining Co. at Ardmore reports a daily throughput of 3,300 bbls. and is now redesigning and increasing its cracking capacity.

Estimated daily crude runs in the North Central Texas district were increased 1,855 bbls. over March, with a total of 33,985 bbls., which compared with 32,130 bbls. last month. Increased crude runs were small at most plants and general throughout the state. The Bryson Refining Co. at Bryson reports an increase in capacity from 350 bbls. to 1,000 bbls.

Southwest Texas' Runs High

Estimated daily crude runs in Southwest Texas are up 2,750 bbls. after last month's decline of 300 bbls. The total for April is reported as 17,450 bbls., compared with 14,700 bbls. for March. The Phoenix Refining Co. at San Antonio increased its runs from 600 bbls. in March to 1,500 bbls. in April. All other plants show a general increase in crude to be processed during the month.

In the North Louisiana and Arkansas areas, crude runs remained practically unchanged, with Arkansas refineries showing a gain of 700 bbls. daily for April. Total crude runs for Arkansas are 25,400 bbls., compared with 24,700 bbls. in March. North Louisiana has a small gain with 41,700 bbls. scheduled for April, compared with 41,650 bbls. in March. The Lake-Price refinery at Princeton, La., is now shut down.

The West Texas and Panhandle area reports increased crude runs generally, with a total of 82,250 bbls. in April compared with 79,300 bbls. in March, a gain of 2,950 bbls. Although all plants reported some increase in activities, the Phillips refinery at Borger reduced its daily throughput from 26,600 bbls. in March to 24,150 bbls. in April, a decrease of 2,450 bbls.

Mid-Continent Crude Runs

Average Daily (Barrels)

(Advance estimate compiled by The Oil and Gas Journal)

	1937	1938	1939
January	531,535	529,710	503,405
February	541,790	507,985	494,910
March	533,875	491,935	497,180
April	558,385	532,120	523,535
May	572,855	527,315	.....
June	593,625	540,005	.....
July	605,640	557,520	.....
August	624,475	554,810	.....
September	625,485	555,695	.....
October	619,210	531,325	.....
November	592,170	524,035	.....
December	544,040	503,530	.....

Operations by Refinery Districts

Daily crude runs

	Apr.	Mar.	Incr.
Arkansas	25,400	24,700	700
East Texas	44,075	35,675	8,400
Kansas	128,575	123,925	4,650
N. Central Texas	33,985	32,130	1,855
North Louisiana	41,700	41,650	50
Oklahoma	149,900	145,100	3,900
Southwest Texas	17,450	14,700	2,750
W. Texas Panhandle	82,250	79,300	2,950
Total	523,335	497,180	26,155

Estimated Daily Average Mid-Continent Refinery Crude Runs for April

OKLAHOMA

Company and location—	Daily capacity	Av. dly. runs Apr.	Av. dly. runs Mar.
Anderson-Prichard Ref. Corp., Cyril	7,500	7,000	6,500
Barnsdall Ref. Corp., Barnsdall	5,000	4,000	3,500
Bell Oil & Gas Co., Granfield	5,000	3,000	3,000
Ben Franklin Ref. Co., Ardmore	4,000	3,300	3,300
Black Gold Ref. Co., Oklahoma City	2,500	(*)	(*)
Champlin Ref. Co., Enid	16,000	15,000	15,000
Cities Service Oil Co., Okmulgee	4,000	(*)	(*)
Cities Service Oil Co., Ponca City	12,000	10,200	10,000
Continental Oil Co., Ponca City	28,000	19,500	18,500
Cosco Oil Co., Wynnewood	2,500	(*)	(*)
Cushing Ref. & Gasoline Co., Blackwell	1,700	(*)	(*)
Cushing Ref. & Gasoline Co., Cushing	4,200	4,000	4,000
Deep Rock Oil Corp., Cushing	10,000	9,000	9,000
Eason Oil Co., Enid	3,000	(*)	(*)
Globe Oil & Ref. Co., Blackwell	8,000	(*)	(*)
Johnson Oil Ref. Co., Cleveland	6,000	4,000	4,500
Knox Ref. Co., Covington	300	100	100
Mid-Continent Pet. Corp., West Tulsa	35,000	20,000	20,000
Ohio Oil Co., Bristow	5,000	2,500	2,000
Omar Ref. Co., Garber	5,000	3,400	2,500
Phillips Pet. Co., Okmulgee	6,500	5,500	5,500
Peppers Gasoline Co., Oklahoma City	500	400	350
Pure Oil Co., Muskogee	9,000	(*)	(*)
Rock Island Ref. Co., Beckett	6,500	5,400	5,000
Sinclair Ref. Co., Sand Springs	6,000	4,000	4,000
Sun Oil Co., Yale	5,000	1,800	2,000
Sunray Oil Co., Allen	7,000	4,000	3,850
Texas Co., West Tulsa	16,000	10,000	10,000
Tide Water Oil Co., Drumright	12,000	9,000	8,000
Wilcox Ref. Division, Bristow	6,000	4,800	4,500
Total	239,700	149,900	145,100

*Shut down.

KANSAS

Company and location—	Daily capacity	Av. dly. runs Apr.	Av. dly. runs Mar.
Anco Ref. Co., Garnett	500	425	425
Barnsdall Ref Co., Wichita	5,000	5,000	4,500
Bay Pet Co., McPherson	4,000	3,750	3,500
Chanute Ref. Co., Chanute	1,000	900	700
Chase Ref. Co., Chase	800	(*)	(*)
Derby Oil Co., Wichita	8,000	6,000	5,000
El Dorado Ref. Co., Eldorado	5,000	4,000	3,500
Falcon Ref. Co., Inc., Great Bend	1,000	500	600
Globe Oil & Ref. Co., McPherson	13,000	13,500	12,500
Kanotex Ref. Co., Arkansas City	12,000	6,000	5,500
National Ref. Co., Coffeyville	8,000	5,000	5,000
Pet. Products Co., Chanute	1,250	1,200	1,000
Phillips Pet. Co., Kansas City	23,000	17,000	17,000
Roper Pet Co., Parsons	750	500	500
Shallow Water Ref. Co., Scott City	2,500	1,100	1,000
Sinclair Ref. Co., Coffeyville	12,000	8,000	8,000
Sinclair Ref. Co., Argentine	11,000	8,000	8,000
Skelly Oil Co., Eldorado	23,000	20,000	20,000
Socony-Vacuum Oil Co., Inc., Augusta	20,000	17,000	17,000
Standard Oil Co., (Indiana) Neodesha	7,500	7,000	7,000
United Ref. Co., Russell	1,200	700	700
Vickers Pet. Co., Potwin	4,000	3,000	2,500
Total	165,140	128,575	123,925

NORTH CENTRAL TEXAS

Company and location—	Daily capacity	Av. dly. runs Apr.	Av. dly. runs Mar.
Bryson Pipe Line & Ref. Co., Bryson	2,000	1,250	1,000
Bryson Ref. Co., Inc., Bryson	1,000	600	500
Coleman Ref. Co., Coleman	1,000	400	500
Continental Oil Co., Wichita Falls	6,000	3,300	4,200
Denver Prod. & Ref. Co., Gainesville	3,000	(*)	(*)
Exchange Pet. Corp., Albany	800	(*)	(*)
Falls Ref. Co., Wichita Falls	2,500	500	450
Gratex Ref. & Fuel Oil Co., Graham	300	285	280
Gulf Oil Corp., Fort Worth	8,000	5,800	5,000
Hightower Oil & Ref. Corp., Brownwood	750	300	200
Jacksboro Ref. Co., Jacksboro	400	250	200
La Salle Pet. Co., Burkburnett	3,000	1,000	900
Mankins Ref. Co., Mankins	1,500	1,000	950
Magnolia Pet. Co., Fort Worth	7,500	5,000	5,000
Muenster Ref. Co., Muenster	400	400	200
North Texas Ref. Co., Gainesville	600	300	250
Ohio Oil Co., Fort Worth	5,000	4,000	3,800
Olney Oil & Ref. Co., North Olney	3,500	1,000	1,000
Panhandle Ref. Co., Wichita Falls	4,200	2,700	2,500
Panhandle Ref. Co., Lueders	1,500	1,000	900
Taylor Ref. Co., Taylor	1,000	600	600
Texas Pacific Coal & Oil Co., Caddo	800	600	550
Tucker Oil Co., Burkburnett	250	200	150
W. T. Waggoner Est., Vernon	4,000	3,500	3,000
Total	64,700	33,985	32,130

*Shut down.

NORTH LOUISIANA

Company and location—	Daily capacity	Av. dly. runs Apr.	Av. dly. runs Mar.
Arkansas Fuel Oil Co., Bossier City	25,000	20,000	20,000
Atlas Pipe Line Co., Shreveport	12,500	4,000	4,000
Bayou State Oil Corp., Hosston	750	500	500
East Texas Ref. Co., Sandra	7,000	1,700	1,700
Lake-Price Refineries, Inc., Princeton	800	(*)	450
Premier Oil Ref. Co. of Texas, Cotton Valley	3,500	3,000	3,000
Rodessa Oil & Ref. Corp., Cedar Grove	12,000	10,000	10,000
Stanolind Oil & Ref. Co., Superior	5,000	2,500	2,000
Total	62,750	41,700	41,650

*Shut down.

ARKANSAS

Berry Asphalt Co., Waterloo	2,000	1,400	1,200
Henry H. Cross, Smackover	6,000	2,500	2,500
Lion Oil Ref. Co., El Dorado	17,000	12,000	12,000
Macmillan Pet. Corp., Norphlet	2,500	2,000	2,000
Root Ref. Co., El Dorado	10,000	7,000	6,500
Stephens Ref. Co., Stephens	700	500	500
Total	38,200	25,400	24,700

EAST TEXAS

Beacon Oil & Ref. Co., Henderson	4,500	(*)	(*)
Clay Ref. Co., Arp	3,500	(*)	(*)
Danciger Refs., Inc., Longview	6,000	(*)	(*)
East Texas Ref. Co., Longview	6,000	5,000	3,200
Hurricane Pet. Corp., Overton	5,000	2,875	2,875
Hurricane Pet. Corp., Arp	3,300	1,900	1,900
Lacy Ref. Co., Kilgore	3,000	2,300	2,300
Magnolia Pet. Co., Corsicana	5,000	4,200	4,200
McMurrey Ref. Co., Tyler	10,000	4,800	4,000
Paluxy Asphalt Co., Talco	5,000	2,500	2,000
Premier Oil Ref. of Texas, Greggtown	4,000	3,000	2,900
Sinclair Ref. Co., Camp Switch	4,000	(*)	(*)
Solvex Refs., Inc., Gladewater	4,500	(*)	(*)
Southport Pet. Co., Kilgore	4,000	3,000	2,500
Talco Asphalt & Ref. Co., Mount Pleasant	7,500	5,000	500
Texas Co., Dallas	16,000	8,000	8,000
Texas Oil Products Co., Gladewater	3,000	1,500	1,300
Tower Ref. Co., Overton	3,500	(*)	(*)
Utah Ref. Co., Kilgore	2,000	(*)	(*)
Total	105,300	44,075	35,675

*Shut down.

SOUTHWEST TEXAS

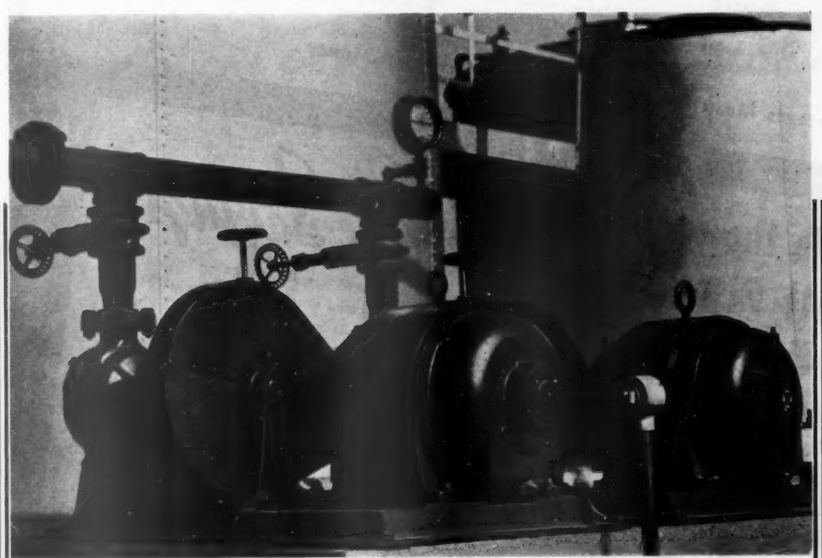
Company and location—	Daily capacity	Av. dly. runs Apr.	Av. dly. runs Mar.
Border Oil & Ref. Co., Sullivan City	1,000	400	200
Carle Ref. Co., Inc., San Antonio	1,000	(*)	(*)
Eggleston Oil Producers Co., Three Rivers	1,000	1,000	700
Humble Oil & Ref. Co., San Antonio	5,000	3,500	3,000
Ina Oil & Ref. Co., Hondo	400	(*)	(*)
Magnolia Pet. Co., Luling	8,000	5,000	4,950
Majestic Ref. Co., Dale	500	100	100
Misko Refineries, Inc., Mirando City	4,500	(*)	(*)
Pettus Oil & Ref. Co., Pettus	1,000	850	900
Phoenix Ref. Co., San Antonio	1,200	1,500	600
Phoenix Ref. Co., Pettus	900	750	500
Pioneer Oil & Ref. Co., Somerset	2,000	750	750
Rado Ref. & Prod. Co., McAllen	800	600	500
Texas Co., San Antonio	5,000	3,000	2,500
Total	32,300	17,450	14,700

*Shut down.

WEST TEXAS AND PANHANDLE

Aero Gas & Ref. Co., Fort Stockton	350	250	100
Coltex Ref. Co., Colorado	12,500	8,000	8,000
Concho Ref. Co., San Angelo	250	(*)	(*)
Cosden Oil Co., Big Spring	12,500	10,500	10,000
Danciger Refs., Inc., Pampa	6,500	5,400	5,500
Danube Oil Corp., Borger	1,200	800	700
Farmers Ref., Lubbock	500	250	200
Gulf Oil Corp., Sweetwater	7,000	6,800	5,500
Howard County Ref. Co., Big Spring	2,000	650	550
Moutray Oil Co., Hawley	1,400	850	800
Onyx Ref. Corp., Hawley	3,000	1,800	1,800
Panhandle Ref. Co., Kings Mill	2,500	1,200	1,200
Payward Ref. Co., Shamrock	600	500	500
Phillips Pet. Co., Borger	35,000	24,150	26,600
Post Refining Co., Rotan	800	500	500
Shamrock Oil & Gas Corp., Sunray	3,000	2,250	2,000
Stamford Ref. Co., Stamford	450	400	400
Shamrock Oil & Gas Corp., Lefors	1,600	1,200	1,000
Standard Oil Co., of Texas, El Paso	14,000	8,500	7,500
Star Light Ref. Co., Ballinger	1,000	500	150
Texas Co., El Paso	2,000	1,500	1,200
Texas Co., Amarillo	6,000	3,000	2,500
Western Ref. Co., Fort Stockton	1,000	750	600
Wickett Pet. Co., Wickett	3,500	2,500	2,000
Total	122,050	82,250	79,300

**Shut down.



PETROLEUM PRODUCTS *and their* PUMPING PROBLEMS

There is no hesitancy on the part of the Viking Pump Company to recommend a different style of pump when the installation warrants it. But today, hundreds of petroleum pumping jobs are being handled far better with Viking Rotary Pumps, than with any other style.

If you have a petroleum pumping job to solve, it will pay you to investigate Viking . . . the truly unique rotary pump.

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The High Pressure Watch Dog

DEPENDABLE PROTECTION

Like a well-trained watch dog, the Lonergan Model "HDF" High Pressure Relief Valve maintains a constant vigil against surprise attacks of excess pressure. It functions properly without attention and under all conditions of service. Backed by our sixty-seven years of experience in the manufacture of power plant safety appliances, the "HDF" represents, we believe, the final word in relief valves for oil and gas service.

Dependable protection is provided because of our ability to properly design each product and apply the experience acquired under actual service conditions. For instance, the "HDF" is made with a heavy drop forged steel body. Bonnet and cap are cast steel and the seats are either monel or stainless steel rather than bronze. This type of construction means uninterrupted service and long life. Can be furnished with exposed spring and stainless steel construction throughout when specified.

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GAUGES · VALVES · SPECIALTIES

A Bang-Up Coupling Job!

The Following Table Summarizes ROLAGRIP Advantages for Tank Connections

As Compared to Flanges

1. Rolagrip's first cost is much lower.
2. No previous cutting or threading of pipe necessary with Rolagrip.
3. Pipe can be several degrees off alignment with Rolagrip.
4. Only two bolts to tighten on the Rolagrip—hence, quicker work and more joints per hour.

As Compared to Grooved Types

1. Rolagrip's first cost is slightly higher.

However . . .

2. Rolagrip eliminates expensive pre-cutting and grooving of pipe; all necessary cutting can be done on the job with Rolagrip.
3. Saving of time and labor much more than offsets the slight difference in the first cost.

As Compared to Other High Pressure Plain End Types

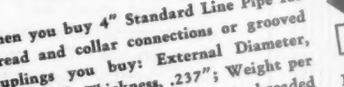
1. Rolagrip's first cost is lower.
2. Rolagrip insures a more dependable grip on pipe.
3. Rolagrip's free action takes care of contraction and expansion.
4. Rolagrip's line contact insures against sticking or against freezing as a result of rusting.

These Advantages Mean An Actual Saving of Time and Money

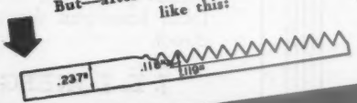
AND

Rolagrip makes possible the use of Lighter Wall Pipe at *Considerable Savings!*

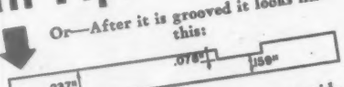
When you buy 4" Standard Line Pipe for thread and collar connections or grooved couplings you buy: External Diameter, 4.5"; Thickness, .237"; Weight per Foot, 10.79 lbs. Before it is threaded or grooved the wall looks like this:



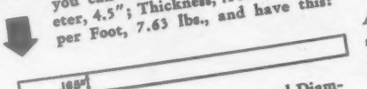
But—after it is threaded it looks like this:



Or—After it is grooved it looks like this:



Now, for Rolagrip Couplings, at a considerable saving in pipe price and freight, you can buy this: External Diameter, 4.5"; Thickness, .165"; Weight per Foot, 7.63 lbs., and have this:



or you can buy this: External Diameter, 4.5"; Thickness, .134"; Weight per Foot, 6.24 lbs., and have this:

4" Pipe—.165" wall gauge—7.63 lb. weight has rated working pressure of 917 to 1375 pounds per square inch. 4" Pipe —.134" wall gauge—6.24 lb. weight has rated working pressure of 744 pounds per square inch.

Real Dollar Savings Per Mile

As an example: On many 4" lines cost savings on pipe and freight made possible through the use of Rolagrip Couplings amount to as much as $800.00 per mile, and this does not include the additional savings in cost of laying or through time saved in getting the line into service.

GUSTIN-BACON MANUFACTURING CO.
KANSAS CITY, MISSOURI
TULSA - HOUSTON - FT. WORTH
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FIELD OPERATIONS

Summarizing the Week's Developments

KANSAS—A pool opener was completed in Section 24-20-12w, Barton County, about 1¼ miles southwest of the Clawson area. Work was started at an Arbuckle lime test in Johnson County, Forest City basin. An outpost in Section 7-24-10w, found saturation in cores and may extend the Zenith pool from Stafford into Reno County. A well midway between the Schroeder and Wilkins pools in Ellsworth County cored saturation and gave promise of joining those areas.

OKLAHOMA—Work was started at wildcats in Harper County, northwestern Oklahoma, and west of the Lamont area, Grant County. A wildcat near Headrick, Jackson County, southwestern Oklahoma, had an oil showing at around 1,332 feet. A wildcat near the Sac and Fox pool of Lincoln County gave promise of opening a Prue sand pool in southwestern Creek County.

GULF COAST TEXAS—Several tests were abandoned in semiproven areas. One important wildcat in Brazoria County made a disappointing showing.

SOUTHWEST TEXAS—Two important outposts were being completed in the Benavides area in Duval County, both showing favorably. Deeper sand production was found in the South Clara Driscoll field in Nueces County and Kelsey field, which lies in Jim Hogg and Brooks counties.

WEST CENTRAL TEXAS—New pools are assured in Callahan and Stephens counties, one 11 miles southeast of Cisco and the other in Section 39, T.&P. Survey.

WEST TEXAS—A 4,586-bbl. well was completed in Ector County. Five wildcats were started in the Permian basin district. The McKnight and deep Ordovician sand areas in Crane County were extended. One more oil well between the Wasson and Bennett pools in Yoakum County helps to bring them closer together.

NORTH TEXAS—The Walnut Bend pool in Cooke County is promised a continuous drilling campaign, while 8 miles southeast of Muenster a wildcat is showing shallow Ordovician lime indications. North offset to the discovery well in the Griffin area in Archer County cored dry broken sand where oil was expected.

EASTERN TEXAS—The Navarro Crossing pool has been extended into Leon County by Humble Oil & Refining Co., which has extended its pipe line into the field and posted a price of $1 per barrel for crude. Northwestern Henderson County has a new Woodbine sand pool north of the Flag Lake pool.

ILLINOIS—The largest new wells of the week were completed in Clay County averaging 860 bbls. to the well in initial production. Eighteen wells in the Louden pool in Fayette averaged 224 bbls. per well. Forty-six oil wells were completed in the state.

LA-ARK-TEX—Deep oil production was opened in the Shongaloo gas field in Webster Parish.

CALIFORNIA—The Southeast Coalinga field was given good promise of an extension of 4 miles by Amerada Petroleum's Gatchell sand prospect in Section 17-19-16, in Fresno County.

NEW MEXICO—A wildcat in Section 6-18-29, midway between the Artesia and Loco Hills areas in Eddy County, opened a pool in oil sand at 2,492-2,570 feet.

Completions in All Fields

(Week Ending April 8, 1939)

	Oil	Gas	Dry	Total	1939 total comp. to date	1938 total comp. to date
N. Y., Pa., and W. Va.	33	14	3	50	856	1,327
Ohio	5	8	4	17	235	251
Indiana	4	4	4	12	41	25
Kentucky	8	1	12	21	158	194
Illinois	46	0	18	64	889	197
Michigan	15	0	9	24	298	191
Kansas	10	2	4	16	285	500
Oklahoma	16	4	12	32	472	458
Texas:						
North Central Texas	27	0	27	54	601	748
West Texas	42	0	2	44	505	637
Texas Panhandle	7	1	1	9	103	193
East Texas	1	0	0	1	171	665
East Central Texas	0	0	6	6	64	101
East Texas Border	0	0	0	0	21	48
Gulf Coast Texas	20	1	5	26	357	338
Southwest Texas	28	1	11	40	618	566
Total Texas	125	3	52	180	2,440	3,296
North Louisiana	8	1	2	11	128	167
Gulf Coast Louisiana	9	0	1	10	154	138
Total Louisiana	17	1	3	21	282	305
Arkansas	0	0	0	0	64	63
Montana	4	2	0	6	32	17
Wyoming	1	0	0	1	27	50
Colorado	0	0	0	0	3	1
New Mexico	5	0	1	6	159	164
Utah	0	0	0	0	0	0
California	9	1	6	16	250	374
Total United States	298	40	128	466	6,491	7,413
Total previous week	319	22	112	453		
Week ending Apr. 9, 1938	348	27	102	477		

Outstanding Fields—Highlights

(Week Ending April 8, 1939)

FIELD—	Rigs up	Wells drlg.	Weekly oil completions	Initial prod.	Total No. oil wells	Daily av. prod.
TEXAS						
K.M.A.	25	41	5	4,843	960	23,498
Wasson-Bennett	11	33	6	6,922	264	10,212
Ector County	6	57	11	16,004	1,639	45,848
Winkler County	1	12	3	4,718	1,784	37,000
Howard-Glasscock	4	23	2	680	1,054	16,050
East Texas	8	17	1	12	26,027	447,086
OKLAHOMA						
St. Louis	4	23	5	1,026	800	29,675
Sac and Fox	4	9	2	145	108	3,400
KANSAS						
Barton County	2	16	2	3,369	415	10,796
Stafford County	3	9	2	1,570	255	4,728
Rice County	4	24	1	337	1,288	27,224
Russell County	5	21	1	1,218	1,209	23,655
NEW MEXICO						
Lea County	18	67	5	935	2,066	103,590
LA-ARK-TEX						
Shreveport, La.	4	13	3	1,365	20	3,845
Cotton Valley, La. (deep)	2	8	1	150	121	12,690
Jennings, La.	0	6	0	0	143	23,868
MICHIGAN						
Freeman-Redding	3	27	1	700	71	12,614
Van Buren County	4	28	7	3,180	183	13,961
ILLINOIS						
Central Illinois	36	326	46	10,639	2,768	159,737
CALIFORNIA						
Wilmington	4	11	2	1,608	611	88,500
KENTUCKY						
Birk City	1	11	0	0	1,224	3,115

Illinois and Kentucky

By STAFF CORRESPONDENT

46 Oil Wells, 18 Dry Holes, Record of Week in Illinois

SALEM, Ill., Apr. 10.—Forty-six oil wells and 18 dry holes, a total of 64 completions, comprised the record of the Illinois fields in the past week in review. All of the oil wells were in the basin fields. Lawrence County is charged with three failures, while one dry hole each was reported from Fayette, Jefferson, Wayne, White, Gallatin, Johnson, Madison, Clinton, Crawford, Effingham, Jasper, Macon, Edgar, Clark and Macoupin counties.

Clay County had seven new oil wells with total initial production of 6,020 bbls.; Fayette County, 18 oil wells and 4,037 bbls. initial production; Marion County, 18 oil wells, with 2,815 bbls. initial, but as usual, a considerable number of these wells were permitted to flow only three hours on their first day. A 111-bbl. well was completed in Wayne County, and a 205-bbl. well in Washington County. Richland reported one new well with 266 bbls. of first day production. There were no gas wells among the completions, but in the Louden field in Fayette County some of the wells produced gas with the oil, but in no great volume.

This week should see several wells in the new Cordes pool in Washington County converted into completed oil producers. Manitou Petroleum Co. completed No. 1 Oak Grove Cemetery, in Section 15-3s-3w. It pumped 205 bbls. in 24 hours from Bethel sand at 1,267-88 feet. Shell Oil Co. No. 1 Holston, NE cor. NW Section 22-3s-3w, swabbed 133 bbls. in 23 hours from sand at 1,270-93 feet. It was not yet a completion. Thompson No. 1 Musial, SE SW NW Section 19-3s-1w, old total depth 1,383 feet, plugged back to 1,262 feet, showing of oil, will shoot. Thompson Drilling Co. No. 1 Rosanski, NW NW SW Section 19-3s-1w, set 5½-inch casing at 1,237 feet. Phillips Petroleum Co. No. 1 Hunleth, NE NW NE Section 32-3s-4w, moving in rotary tools. J. J. Broadus No. 1 Chapman, NW cor. SE Section 35-3s-3w, drilling at 1,182 feet. Lewis & Lilley No. 1 Gill and Goodner, NE cor. NW SW Section 23-3s-3w, total depth 1,257 feet, shut down; Benoist sand topped at 1,252 feet, pipe set on top sand. McBride, Inc. No. 2 S. Weise, NE SW SE Section 15-3s-3w, drilling at 1,200 feet. McBride, Inc. No. 1 Weise, NW SW SE Section 15-3s-3w, Benoist sand at 1,256-82 feet, set 7-inch casing at 1,267 feet, shot with 15 quarts, casing collapsed and crew was swaging the pipe. Manitou Petroleum Co. No. 2 Oak Grove Cemetery, NE cor. SE SE SW Section 15-3s-3w, Benoist sand at 1,272-83 feet, still in sand, set 7-inch casing at 1,271 feet, 500 feet of oil in the hole. Magnolia Petroleum Co. No. 1 Francis, SE SE SW Section 15-3s-3w, total depth 1,274 feet, setting casing. Webster and others No. 1 Oexeman, NW cor. SW NE SW Section 5-3s-3w, drilling below 800 feet. Pollack No. 1 Leibrock, SE SE SW Section 2-3s-3w, drilling at 150 feet. Shell Oil Co. No. 2 Holston, 165 feet from north and 340 feet from east lines, NW quarter Section 22-3s-3w, coring below 1,200 feet.

Clay County

In Clay County, Pure Oil Co. No. 3 Eden, C W half SW NE Section 5-2n-8e, Fredonia lime top at 2,988 feet, pays and showings at intervals from 2,998 feet to 3,085 feet, total depth 3,100 feet, flowed 910 bbls. through tubing. Pure No. 1 Schott, C E half NW SW Section 5-2n-8e, Fredonia top at 2,990 feet, pays at intervals from 2,994 feet to 3,090 feet, total depth 3,115 feet, acidized with 5,000 gallons, flowed 970 bbls. through tubing. Pure No. 5 Schott, C E half SE SW Section 5-2n-8e, Fredonia at 2,975 feet, pays at intervals from 2,989 feet to 3,050 feet, total depth 3,081 feet, acidized with 5,000 gallons, flowed 754 bbls. through 2-inch tubing. Pure No. 6 Schott, C E half SW SW Section 5-2n-8e, Fredonia at 2,997 feet, pays from 3,000 feet to 3,081 feet at intervals, acidized with 5,000 gallons, flowed 975 bbls. Pure No. 4 Lee Clark, C W half NE NW Section 8-2n-8e, Fredonia at 2,985 feet, pays and showings from 2,990 feet to 3,093 feet, total depth 3,100 feet, acidized with 3,000 gallons, flowed 961 bbls. Pure No. 1 Bissey, C E half NE NW Section 17-2n-8e, Fredonia at 2,988 feet, pays and showings from 3,005 feet to 3,085 feet, total depth 3,105 feet, acidized with 5,000 gallons, pumped 74 bbls. of net oil. Pure No. 1 Fitch Powell Consolidated, NE SW SW Section 3-1n-8e, Fredonia at 3,027 feet, showings and pays at 3,028-45 feet, total depth 3,130 feet, flowed 1,348 bbls., cut with 1.8 per cent salt water. Pure No. 1 Brach A, C E half SE NW Section 34-1n-7e, Fredonia 3,120 feet, showings and pays 3,121-57 feet, total depth 3,167 feet, pumped 28 bbls. of oil and 70 bbls. of salt water.

In Fayette County

In Fayette County, Louden pool, Carter Oil Co. No. 2 Gregg, NE SE SW Section 10-8n-3e, Stray sand at 1,599-1,613 feet, shot with 20 quarts, pumped 114 bbls. Carter Oil Co. No. 1 Sloan, NE SE SE Section 2-8n-3e, Stray sand at 1,668-77 feet, shot with 15 quarts, swabbed 89 bbls., then plugged back to 1,526 feet and Weiler sand at 1,497-1,507 feet was shot with 30 quarts; swabbed 247 bbls. and later upon completion 214 bbls. in 24 hours. Carter No. 1 Pearl McClain, SW SE SE Section 32-8n-3e, Bethel sand at 1,569-85 feet, shot with 20 quarts, flowed 312 bbls. through tubing. Carter No. 1 Fortner, SW NE SE Section 10-8n-3e, Stray sand at 1,563-73 feet and 1,585-1,608 feet, pumped 114 bbls.

Carter Oil Co. No. 1 Durbin, NW NW NE Section 4-7n-3e, Stray sand at 1,567-73 feet, shot with 20 quarts, swabbed 288 bbls. through casing. Carter No. 3 Hopper, NE NW SW Section 5-7n-3e, Bethel sand at 1,559-81 feet, shot with 20 quarts, swabbed and flowed 520 bbls. through casing. Carter No. 3 Deal, NW SW NE Section 6-7n-3e, Stray sand at 1,528-38 feet, contained water; plugged back to 1,480 feet, and shot with 80 quarts in Weiler sand at 1,436-95 feet, swabbed and flowed 550 bbls. through casing. Carter No. 2 Mills, NW NW NE Section 7-7n-3e, Bethel sand at 1,555-70 feet, shot with 20 quarts, swabbed 203 bbls. through casing. Carter No. 1 Hawkins, SW SE SW Section 17-7n-3e, Weiler sand at 1,492-1,517 feet, shot with 20 quarts, swabbed 116 bbls. through casing. Carter No. 4 Sidener, NW SE SE Section 19-7n-3e, Weiler sand at 1,514-55 feet, shot with 40 quarts, swabbed 300 bbls. through casing. Shell Oil Co. No. 2 Hugo, NW SE NE Section 20-7n-3e, Weiler sand at 1,515-80 feet, shot with 10 quarts, pumped 151 bbls. Stewart Oil Co. No. 2 McPheeters, NE NW SW Section 28-7n-3e. Weiler at 1,565-85 feet, pumped 150 bbls. Jarvis Brothers No. 8 Homan B, NE SE SW Section 29-7n-3e, Weiler at 1,544-79 feet, shot with 45 quarts, pumped 250 bbls. Whisenant and others No. 10 Smith, NW NE NE Section 30-7n-3e, Weiler sand at 1,560-80 feet, shot with 30 quarts, pumped 110 bbls. T. W. Lee No. 3 Horner, SW SE NW Section 31-7n-3e, sand at 1,581-89 feet, shot with 15 quarts, pumped 180 bbls. T. W. Lee No. 4 Horner, NW cor. SW SE NW Section 31-7n-3e, Weiler at 1,572-89 feet, shot with 15 quarts, pumped 190 bbls. Texas Co. No. 2 Kepner, NE cor. NW SW Section 31-7n-3e, Weiler sand at 1,568-77 feet, pumped 147 bbls.

Ohio Oil Co. No. 1 Rush, NE cor. NW SW Section 30-6n-3e, Weiler at 1,573-89 feet, pumped 128 bbls. of 36.6-gravity. Shriver & Martin No. 1 Magnus, C SE SW Section 11-5n-2e, dry and abandoned at 1,817 feet, Weiler sand topped at 1,775 feet, showed no oil.

Marion County

In the north end of the Salem pool in Marion County, Texas Co. No. 7 Stonecipher, SE SW SE Section 32-2n-2e, Benoist sand at 1,745-95 feet, flowed 40 bbls. in three hours, rated at 280 bbls. a day. Texas No. 6 Stroup, SW SE NW Section 31-2n-2e, Benoist at 1,740-64 feet, flowed 42 bbls. in three hours, rated at 294 bbls. a day. Texas Co. No. 4 Stroup, NE SE SW Section 30-2n-2e, McClosky lime pays at 1,985 feet to 2,007 feet, at intervals, flowed 53 bbls. in three hours, rated at 371 bbls. a day. Texas No. 11 D. Young, SW SW NW Section 21-2n-2e, McClosky at 1,983 feet, pays at 1,981-90 feet, flowed 220 bbls. in three hours, rated at 1,540 bbls. a day. Magnolia Petroleum Co. No. 10 D. A. Shanafelt, NW cor. NE NW NW Section 21-2n-2e, Benoist at 1,791 to 1,838 feet, shot with 50 quarts, flowed 497 bbls. Max Pray No. 3 Cole, SE NW SE Section 16-2n-2e, McClosky lime at 2,070-83 feet, acidized with 1,000 gallons, flowed 1,200 bbls.

In the south end of the Salem pool, Texas Co. No. 4 Snider, SW SW NE Section 9-1n-2e, drilled to 2,132 feet and lower levels found dry; pipe perforated opposite Benoist sand at 1,874-86 feet, pumped 9 bbls. in three hours. Texas No. 6 Richardson, SW SE NW Section 5-1n-2e, Benoist at 1,711-64 feet, flowed 69 bbls. in three hours, rated at 483 bbls. a day. Texas Co. No. 8 Tate, SE SW NW Section 5-1n-2e, flowed 90 bbls. in three hours, rated at 630 bbls. a day. Texas No. 24 Kalkbrenner, SE SE SW Section 5-1n-2e, Benoist at 1,756-94 feet, flowed 40 bbls. in three hours, rated at 280 bbls. a day. Texas No. 22 Kalkbrenner, SE NE SW Section 5-1n-2e, Benoist at 1,741-82 feet, flowed 34 bbls. in three hours, rated at 238 bbls. a day. Texas No. 14 Johnson, NE SE SW Section 5-1n-2e, Benoist at 1,741-82 feet, flowed 45 bbls. in three hours, rated at 315 bbls. a day. Texas No. 11 Johnson, NE NE SW Section 5-1n-2e, McClosky at 1,944-61 feet, at intervals, flowed 64 bbls. in three hours, rated at 445 bbls. a day. Texas No. 9 Hawthorne, SW SW SE Section 5-1n-2e, Benoist at 1,767-1,807 feet, flowed 40 bbls. in three hours, rated at 280 bbls. a day. Texas No. 4 Antioch Church, NW cor. SW SE Section 5-1n-2e, McClosky pays at 1,963-92 feet, at intervals, flowed 40 bbls. in three hours, rated at 280 bbls. a day. Texas No. 2 Farthing, NE SW NE Section 4-1n-2e, Benoist at 1,875-85 feet, pumped 20 bbls. in three hours, rated at 140 bbls. a day. Texas No. 17 City of Centralia, NW NW NW Section 4-1n-2e, Benoist at 1,769-21 feet,

Illinois Fields

HIGHLIGHTS OF THE WEEK: Eighteen wildcat dry holes were abandoned in 16 counties. The Cordes pool in Washington County had several wells in the sand, on top of, or near the sand, when the report closed, with two oil wells assured in Sections 15 and 22-3s-3w. The new work started about equalled the 64 wells completed. A legislative committee sitting at Salem, Marion County, was taking testimony of oil producers on the state of the industry in Illinois.

Daily production of new pools, 159,737 bbls.; old pools, 6,702 bbls.; total, 166,439 bbls.

Completed oil wells, 46; operations including locations, rigs up and wells drilling, 388.

flowed 32 bbls. in three hours, rated at 224 bbls. a day.

In Jefferson County, Rosenthal No. 1 High, NW NE NW Section 29-1s-2e, dry and abandoned at 2,132 feet. Benoist sand topped at 2,115 feet.

In Wayne County, Texas Co. No. 5 Lyons, SW SE SE Section 32-2s-7e, Fredonia pay at 3,336-41 feet, pumped 111 bbls. H. H. Weinert No. 1 Cunningham, C S half NW NE Section 27-2s-8e, dry and abandoned at 3,507 feet. Dry Fredonia lime topped at 3,365 feet.

In Washington County, Manitou Petroleum Co. No. 1 Oak Grove Cemetery, SE cor. SW Section 15-3s-3w, Bethel sand at 1,267-88 feet, pumped 205 bbls. in 24 hours.

In White County, Price & Massey No. 1 Higginson, NW NW NE Section 22-4s-10e, Fredonia top at 3,155 feet, dry and abandoned at 3,275 feet.

In Gallatin County, Delta Drilling Co. No. 1 Stenson, SE SE SW Section 9-9s-9e, Fredonia 2,658 feet, dry and abandoned at 2,795 feet.

In Johnson County, Tunnell Hill Oil Co. No. 1, C SW NE Section 30-11s-3e, abandoned at 500 feet.

In Madison County, Penn-Illinois Oil Co. No. 1 Hurlbrink, NE NE NE Section 19-4n-8w, salt water in Silurian at 1,405-15 feet, total depth, abandoned.

In Richland County, Pure Oil Co. No. 9 Wakefield, NE SE SW Section 23-4n-9e, Weiler sand at 2,575-98 feet, pumped 266 bbls.

In Lawrence County, Kesl and others No. 1 Jones, near C E half E half Section 7-4n-10w of second principal meridian, McClosky lime at 1,509-13 feet and 1,580-96 feet, dry and abandoned, total depth 1,701 feet. Rockstead No. 1 Ulrich, SE SW NE Section 20-3n-13w, dry and abandoned at 725 feet. Kitcher & Wilson No. 1 Ackman, C E half C W half SE SE Section 19-3n-11w, dry and abandoned at 500 feet.

In Clinton County, Noelkemper and Murphy No. 1 Kile, SE cor. NE Section 11-3n-3w, water in Cypress and Bethel sands, abandoned at 1,170 feet.

In Crawford County, Caywood No. 1 Tohull, C W half SE NW Section 31-6n-11w of second principal meridian, abandoned at 930 feet.

In Effingham County, Kingwood Oil Co. No. 1 Koester, NE SE SW Section 18-8n-6e, St. Louis lime topped at 2,566 feet, total depth, dry and abandoned.

In Jasper County, Kingwood Oil Co. and Bur-Kan Oil Co. No. 1 Harrison, C W half SW SW Section 2-7n-10e, dry and abandoned at 2,711 feet; top of the St. Louis lime at 2,693 feet.

In Macon County, Snake Hill Development Co. No. 1 Dipper, NE SE NW Section 17-16n-2e, was dry and abandoned at 2,125 feet; top of the Silurian at 2,060 feet.

In Edgar County, Black & Moore No. 1 Sturgell, C NW NE Section 12-12n-11w of second principal meridian, Devonian top at 1,968 feet, water at 2,016-28 feet, total depth; abandoned.

In Clark County, Miller and Miller No. 1 Young, NE cor. NW NE Section 17-11n-14w of second principal meridian, hole full of salt water and abandoned at 505 feet on top of St. Louis limestone.

In Macoupin County, W. G. Dillon and others No. 1 Keele, SE SE NE Section 32-10n-9w, Trenton lime top at 1,445 feet, dry and abandoned at 1,540 feet.

Wildcat Progress

Wildcat progress in many Illinois counties is shown in the following round-up of outpost field work:

In Clinton County, Harris and others No. 1 Hage, C S line, SE SE Section 18-1s-5w, drilling at 1,065 feet.

In Jefferson County, I. Vawter No. 1 Kell, NW SW NE Section 9-1s-1e, drilling at 1,795 feet. V. O. Lewis No. 1 Bates, NE cor. NW NE Section 18-1s-1e, total depth 1,805 feet, will move in rotary tools.

In White County, Shirley & Priest No. 1 Matilda Hon, NE NW SE Section 32-3s-14w of second principal meridian, drilling at 2,008 feet. Mazda Oil Co. No. 1 Baptist Orphanage, SE SE NE Section 22-5s-9e, cellar and pits.

In Franklin County, Adams Oil & Gas Co. No. 1 Old Ben Coal Co., SW SW NE Section 19-5s-2e, total depth 3,848 feet, drill pipe stuck; trying to clear hole.

In Madison County, L. C. Simmell and others No. 1 Keller, NE NE SE Section 7-3n-8w, total depth 1,367 feet, plugged back to 1,300 feet and casing ripped at 1,273-88 feet, acidized with 1,500 gallons, pumped about 25 bbls. of fluid per day, 60 per cent water. Paul Mosebach No. 1 C. Callahan, NW cor. Section 17-3n-8w, rigging up machine.

In Lawrence County, Rosenthal and others No. 1 Norton, C NW NW Section 17-4n-10w, total depth 640 feet, fishing for tools. M. G. Johnson No. 1 Downey, C E half SE NW Section 32-3n-11w, drilling at 2,550 feet.

In Richland County, Worthy E. Dyson No. 1 Wheeler, SW NE NE Section 24-4n-9e, total depth 2,574 feet, set 7-inch casing at 2,560 feet, pumped 25 bbls. of fluid half oil and half water after a shot; testing.

In Pike County, Apex Drilling Co. No. 1 Weaver, SE NE NE Section 25-3s-4w of fourth principal meridian, drilling at 490 feet.

In Warren County, John Memkin No. 1 Simmins, SE SE NE Section 11-8n-2w of the fourth principal meridian, drilling at 1,040 feet.

In McDonough County, C. H. Chrysl and others No. 1 Wright, SE cor. Section 16-7n-4w of fourth principal meridian, rigging up machine.

In Gallatin County, Bailey & Lucas No. 1 Logan, SW cor. SE NE NE Section 21-8s-8e, total depth 2,143 feet, moving in rotary tools. Dillon and others No. 1 Frohoch, SE SE SE Section 4-10s-8e, moving in rotary tools. J. Garfield Buell No. 1 Sutton, C S half NW NW Section 5-8s-10e, drilling at 2,255 feet. Coates and others No. 1 Green, SW cor. Section 16-9s-9e, total depth 2,711 feet, shut down for orders.

In Saline County, Kingwood Oil Co. No. 1 McIntyre, NW cor. Section 25-9s-7e, derrick.

In Williamson County, Roy Shipman and others No. 1 Chamness, NW SW SW Section 21-9s-2e, drilling at 208 feet.

In St. Clair County, Tanner and Melbourne No. 1 Miller Estate, SW SE NE Section 29-2s-7w, drilling at 550 feet.

In Wabash County, R. S. Hays No. 1 Schmitz, SE NW SW Section 7-3s-13w of second principal meridian, show of oil at 2,139-42 feet, preparing to core. Longhorn Oil Co. No. 1 Helm, SE SE NW Section 15-3s-14w, Ste. Genevieve lime top at 2,870 feet, drilling ahead.

In Menard County, Arthur Scroggins No. 1 Johnson Brothers, C SW SW Section 24-19n-5w, showing of oil and gas in sand at 1,860-65 feet, drilling at 1,885 feet.

In Christian County, G. W. Nelms No. 1 Howell, SE SE NE Section 26-15n-2w, shut down at 180 feet, waiting for a bit.

In Sangamon County, A. C. Leathers No. 1 Workman, NW SE SE Section 28-15n-6w, top of Devonian lime 1,410 feet, drilling at 1,903 feet.

In Monroe County, Ames Oil Co. No. 1 Gunnerscheimer, C SE NW Section 2-2s-10w, Trenton lime top at 410 feet; small showing at 410-12 feet and pay at 426-34 feet, acidized with 1,000 gallons, flowed 30 bbls. of fluid in one head, 40 per cent water; will plug back.

In Montgomery County, Cassen and others No. 1 Wilkering, NW SW NE Section 34-10n-2w, drilling at 374 feet. Fred DeMier, SW SE SW Section 31-9n-4w, total depth 1,172 feet, running casing.

In Cumberland County, Manitou Petroleum Co. No. 1 Wilcox, NW NE NE Section 23-10n-10e, spudded. National Consumers Oil Co. No. 1 Ward, NE SE NE Section 17-9n-9e, total depth 2,138 feet, plugged back to 2,138 feet; expect to drill plug and deepen.

In Fayette County, E. Frank Jones No. 1 Zanders, SE cor. NW Section 36-9n-3e, Weiler sand at 1,564-81 feet, fair saturation; will set casing. Carter Oil No. 1 Henry Tucker, SW NE SE Section 32-8n-3e, rotary derrick. Carter No. 1 Fichtman, NW SW SE Section 22-8n-3e, rotary derrick up. Carter Oil No. 1 Sloan, SE SW SE Section 2-8n-3e, location. Carter Oil No. 1 Mike McDonald, NW NW SW Section 8-2n-3e, location.

In Jasper County, Thompson Drilling Co. No. 1 Bowers, SW NE SW Section 7-8n-10e, drilling at 2,357 feet; no showing in Cypress sand topped at 2,347 feet. National Consumers No. 1 Leamon, NW cor. SW SW Section 4-8n-14w of second principal meridian, McClosky at 1,329 feet, streaks of saturation at 1,329-62 feet, total depth, rigging up standard tools and set pipe at 1,323 feet, drilling cement.

In Bond County, Eason Oil Co. No. 1 Bank, NE NE NW Section 24-4n-3w, Ste. Genevieve lime top at 1,268

(Continued on Page 70)

Western Kentucky Made Poor Showing With 12 Dry Holes

OWENSBORO, Ky., Apr. 10.—Three oil wells with a combined initial production of only 115 bbls.; one gas well and 12 dry holes formed the rather disastrous record of western Kentucky fields in the past week.

Three of the dry holes were McClosky lime tests, but another was a 4,689-foot failure in the Cairo district drilled by Phillips Petroleum Co.

Following is the record in detail, together with new work started:

Breckenridge County, Westville district: H. C. Hume, trustee, No. 1 W. L. Leslie, drilling at 350 feet. Glen Dean district: Charles Marsh and others No. 1 Mrs. Delia Moorman, 5-bbl. well, total depth 483 feet.

Butler County, Silver City district: Anna K. Wilson & Co. No. 2 T. Clements, dry hole, total depth 931 feet; Hart Petroleum Co. No. 1 Opal Harper, dry hole, total depth 256 feet; No. 2, a dry hole, total depth 169 feet.

Christian County, Bluff Springs district: F. C. Thomas and A. F. Crider No. 1 Meacham, old well cleaned out and acidized; old total depth 2,300 feet; did not make commercial well, abandoned.

Daviess County, Birk City district: J. C. Miller, trustee, and others No. 1 Federal Land Bank, dry hole, total depth 1,935 feet. Utica district: Daugherty & Ellis No. 3 N. C. Howard & O'Flynn, initial production 60 bbls.; combination Jett and Jones sand well. Reed district: W. E. Hupp and others No. 1 Mrs. H. A. Reno, pipe collapsed, total depth 1,543 feet, hole abandoned; No. 2 spudding in.

Hancock County, Troy district: Perry Tichenor and others No. 2 Sam Beauchamp, spudding in. Easton district: J. W. Tuttle No. 1 W. C. Boling, dry hole, total depth 380 feet. Chambers district: William Flesher and others No. 1 Cal Young, dry hole, total depth 765 feet.

Henderson County, Spottsville district: Magnolia Petroleum Co. No. 2 Annie Green, dry hole, total depth 2,588 feet. Reed district: Spring Rose Drilling Co. and others No. 1 Ray Pillman, McClosky saturation 1,976-81 feet, filled up 300 feet with oil after drilling plug; will acidize. Bluff City district: C. A. C. Oil Co. No. 1 L. and N. Ruggles, dry hole, total depth 2,048 feet. Cairo district: Phillips Petroleum Co. No. 1 C. C. Sheffer, dry hole, total depth 4,689 feet.

Muhlenberg County, Belton district: Fred Phillips No. 1 E. H. Boggess, 50-bbl. well, total depth 1,625 feet.

Ohio County, Sulphur Springs district: E. Dehart No. 1 Acton, drilling at 511 feet. Taffy district: Thrasher & White No. 4 A. C. Crowe, dry hole, total depth 638 feet; Ohio Oil Co. No. 22 J. A. Kirk, 100,000 cu. ft. of gas, total depth 324 feet. Buford district: A. Teller, trustee, No. 3 G. W. Hoover, dry hole, total depth 1,387 feet.

Union County, Uniontown district: Brauer & Daniels No. 1 Pollard, dry hole, total depth 3,022 feet.

EASTERN KENTUCKY OPERATIONS

ASHLAND, Ky., Apr. 10.—Five new oil wells and a good showing of oil in another well mark the report of eastern Kentucky operations this week.

Keath & Co. completed No. 6 S. W. Steele, on Duck Fork in the Ida May district of Lee County, with a production of 50 bbls. per day. In the same district, Petroleum Exploration completed No. 3 Pryce Heirs with an initial flow of 25 bbls.

Pryce Fraley No. 1 Dave Mays, in the old Bolner field, Lee County, was reported dry some time ago. Fraley left the rig over the hole for three weeks and then went back to move it and found 90 feet of oil in the hole. He is planning to shoot the well.

J. C. Perry has completed No. 2 Woodard Heirs land on South Fork in the South Fork district of Powell County. It is a 4-bbl. well. In the same district, near Pilot, Joe T. Brown completed No. 3 on the Matt Lowery farm. It started at 15 bbls. a day. Also in this district, on South Fork, Monroe Faulkner drilled in No. 1 Heuistine land, but has not yet pumped the well.

Wildcats to Test Five New Areas in West Texas Field

By
D. H. STORMONT

FORT WORTH, Tex., Apr. 10.—Five new wildcat tests staked throughout West Texas, together with field extension activity in two areas of Crane County, headed developments in the West Texas district.

The largest completions reported in the past week in the West Texas fields were Rushwold Oil Co. No. 2 Woods in Ector County, which started at 4,586 bbls. per day at 4,195-59 feet and Texas Pacific Coal & Oil Co. No. 19 Bennett in Yoakum County, which produced 2,996 bbls. initially at 5,055-5,245 feet, and in West Central Texas, Fain-McGaha and Sinclair Prairie No. 3 Olsen, in Jones County, a 2,240-bbl. well at 3,210-22 feet.

Pecos County's Imperial area, just south of the Pecos River in the northern part of the county, will receive another deep exploratory test. Magnolia Petroleum Co. will drill No. 1 Eaton-Abell in Section 23, Block 3, H.&T.C. Survey. The location is 4 miles southwest of Imperial. Drilling is scheduled to commence this week. It is 6 miles southwest of the same company's No. 1 Tex-Mex-McKee, deep test, abandoned last August at a total depth of 6,267 feet. The new well is to test the Simpson and Ellenburger formations of Lower Ordovician.

In Stonewall County, Forest Development Co. has staked No. 1 T. A. Ellison in Block D, Section 114, H.&T.C. Survey. The pits are being dug and drilling will commence immediately. Tom Green County received two new locations, one being only a projected 300-foot test. Lynn & Cobb are drilling at 100 feet at No. 1 I. B. Cox, Val Mueller Survey No. 176. Roush & Steward are drilling at 75 feet at No. 1 Pugh, James Eldridge Survey No. 73, the operators preparing to test only the shallow 300-foot sand. In Ward County Peerless Oil & Gas Co. is rigging up spudder at No. 1 Texas Cotton Industries, in Section 35, Block 1, H.&T.C. Survey.

Crane County's deep Ordovician area and its McKnight area were both in line for extensions as the week closed. Large gas flow was reported from Gulf Oil Corp. No. 10 Waddell, quarter-mile south outpost to the most southeastern edge of production in the deep Ordovician area in the western part of the county. Bottomed at 5,967 feet, the crew was reported to have displaced the drilling mud with water after which the well cleaned itself flowing 10,000,000 cu. ft. of gas increasing to 14,000,000 cu. ft. after a 15-minute flow. The well is in Section 7, Block 27-B, P.S.L. Survey. Gulf Oil Corp. and Cranfill Brothers No. 16 Tubbs, Section 8, Block 27-B, P.S.L. Survey, half mile southeast outpost to the area, was bottomed at 5,965 feet and preparing to core into the pay section.

South of the Ordovician area a mile northeast extension to the McKnight area appeared assured at the Gulf Oil Corp. No. 5 McKnight, Section 1, Block 21-B, P.S.L. Survey. The test is drilling below 3,482 feet after bailing 48 bbls. of oil from a show encountered from 3,412-25 feet.

Reeves County

In Reeves County, Tide Water Associated Oil Co. has taken over the Pacific Mid-Continent Corp. No. 1 W. A. Tunstill, discovery gas well in the northern part of the county, and is deepening in search of oil production. It was reported that the new operator had drilled out cement plug and was drilling below 3,364 feet in sand. The well originally had been completed by Frankley & Rice at 3,305 feet for 3,770,000 cu. ft. of gas per day. Pacific Mid-Continent took over the well at that depth and deepened to 3,356 feet at which depth Tide Water acquired the test.

Yoakum County

The completion of one Yoakum County wildcat and the undetermined status of another leaves the true proportions of the Wasson and Bennett pools still doubtful. Texas Pacific Coal & Oil Co. completed No. 1 Brownfield, wildcat in Section 802, about midway between the two areas, for a daily production of 982 bbls. The completion of this well for a producer establishes the trend between the two great West Texas fields, but whether or not they will be definitely joined will have to await additional exploration. Shell Oil Co., Inc., No. 1 Waples-Platter Co., wildcat test 2 miles northeast of the Bennett pool, was drilling below 5,225 feet after having found its first oil showings from 5,196 feet to 5,204 feet.

Nolan County

Green & Owens and Metcalf & Halloran No. 1 S. C. Tipton, indicated pool opener in northeastern Nolan County 3 miles southwest of Trent and 14 miles east of Sweetwater, ran casing to 4,370 feet for production tests of an oil-saturated section from 4,387 feet to 4,464 feet. The test is in Section 41, Block 19, T.&P. Survey.

WEST TEXAS COMPLETIONS

(24-hour gauge)

Andrews County

Humble Oil & Refining Co. No. 58 J. S. Means, 4,500-08 feet, 1,687 bbls. Osage Drilling Co. No. 2 University-Phillips, 4,170-4,240 feet, 1,067 bbls.

Crane County

Gulf Oil Corp. No. 191 McElroy, 2,678-2,902 feet, 1,478 bbls. Magnolia Petroleum Co. No. 12 W. P. Edwards, 3,485-3,529 feet, 47 bbls. Parker Drilling Co. No. 1 King-Texas, 2,043-2,136 feet, 450 bbls.

Crockett County

Gilcrease Oil Co. No. 3-16 University, 1,375-1,405 feet, 48 bbls.

Culberson County

Harry Nieheus No. 1 Caldwell, dry and abandoned at 5,008 feet.

Ector County

Atlantic Refining Co. No. 1-G Cummins, 4,230-4,300 feet, 176 bbls. Atlantic Refining Co. No. 4-C University, 3,380-3,650 feet, 849 bbls. Broderick & Calvert No. 1 Vina Bagley, 4,200-96 feet, 1,138 bbls. Gulf Oil Corp. No. 170 Goldsmith, 4,090-4,210 feet, 2,208 bbls. Gulf Oil Corp. No. 172 Goldsmith, 4,128-88 feet, 2,324 bbls. Gulf Oil Corp. No. 174 Goldsmith, 4,103-63 feet, 1,132 bbls. Gulf Oil Corp. No. 176 Goldsmith, 4,140-4,200 feet, 1,400 bbls. Landreth Production Co. No. 7-M Scharbauer, 4,165-85 feet, 761 bbls. Phillips-Pure No. 58 Cowden, 4,112-59 feet, 423 bbls. Rushwold Oil Co. No. 2 Woods, 4,195-4,381 feet, 4,586 bbls. Stanolind Oil & Gas Co. No. 11-A E. F. Cowden, 4,004-4,186 feet, 1,007 bbls.

Howard County

A. Delcambre, Jr., No. 1 O'Daniel, location abandoned. Magnolia Petroleum Co. No. 15 O'Daniel, 2,670-2,810 feet, 248 bbls. Shell Petroleum Corp. No. 3-A Snyder, 2,680-2,880 feet, 432 bbls.

Pecos County

British American Oil Co. No. 15 Payton, 1,592-2,088 feet, 319 bbls. British American Oil Co. No. 16 Payton, 1,886-1,917 feet, 306 bbls. Cities Service Oil Co. No. 1 Dorr, 2,077-92 feet, 297 bbls. Pantex Oil Co. No. 4 State, 1,778-1,865 feet, 297 bbls. Sahara Oil Co. No. 3 Shearer-Atlantic, 1,472-90 feet, 400 bbls.

Upton County

Gulf Oil Corp. No. 190 McElroy, 2,720-3,042 feet, 130 bbls. Harry Hines No. 1 Hobbs, 2,242-95 feet, 412 bbls. McLeon No. 2 Burleson, 2,150-2,215 feet, 1,030 bbls. Shell Petroleum Corp. No. 9 Baker, 2,123-2,206 feet, 462 bbls.

Glasscock County

B. A. Duffy No. 1 Carter-Shell, dry and abandoned at 2,707 feet.

Ward County

Gulf Oil Corp. No. 121 Hutchins, 2,561-2,785 feet, 781 bbls. Gulf Oil Corp. No. 107 O'Brien, 2,693-2,789 feet, 271 bbls. Luse & Ice No. 7 Brictson, 2,057-97 feet, 385 bbls. Jim O'Quinn No. 4 Ellen Hadwin, 2,160-2,230 feet, 33 bbls. Sinclair Prairie Oil Co. No. 4 Magnolia-Sealy, 2,840-3,074 feet, 320 bbls.

Winkler County

Magnolia Petroleum Co. No. 220 Walton, 3,111-85 feet, 514 bbls. Magnolia Petroleum Co. No. 223 Walton, 3,175-3,242 feet, 228 bbls. Shelly Oil No. 28 Halley, 2,742-2,842 feet, 3,976 bbls.

Yoakum County

Denver Producing & Refining Co. No. 12 Whittenberg, 4,894-5,126 feet, 1,082 bbls. Humble Oil & Refining Co. No. 1 Wooten, 4,932-5,134 feet, 733 bbls.; old well drilled deeper. Osage Drilling Co. No. 1 Miller, 4,899-5,106 feet, 145 bbls. Skelly Oil Co. No. 2 Thomas, 4,914-5,141 feet, 1,081 bbls. Texas-Pacific Coal & Oil Co. No. 19 Bennett, 5,055-5,245 feet, 2,996 bbls. Texas-Pacific Coal & Oil Co. No. 1 Cecil Bloomer, 5,015-5,151 feet, 1,680 bbls. Texas-Pacific Coal & Oil Co. No. 1 A. M. Brownfield, 5,000-5,151 feet, 928 bbls.

WEST CENTRAL TEXAS

The assurance of two new oil pools in West Central Texas, one in Callahan County and one in Stephens County, featured the week's activity in that area.

The pool opener in Callahan County was L. A. Warren No. 1 Cozart, in the Matilda Cherry Survey, one-half mile from the Eastland and Callahan County line and 11 miles southwest of Cisco. The discovery well, completed in the Cisco sand, has been rated at 45 bbls. of oil daily after a 14-quart shot. The well is bottomed at 1,675 feet, with saturation from 1,651 feet to total depth. This wildcat producer is on farmout acreage from the Phillips Petroleum Co.

In Stephens County, Lone Star Gas Co. completed No. 1-A McKee, Section 39, T.&P. Survey, to open a new horizon, the Ellenburger lime, in the old Lake sand pool of the southwestern part of the county. On official test the well made 268 bbls. of oil in 24 hours from lime from 4,107-17 feet.

Jack County

G. M. Gillespie's second test on the Oliver Loving lease, southwestern part of Section 3345, T.E.L. Survey, in the western part of Jack County, made an initial gauge of about 100 bbls. of oil. Pay sand was drilled at 3,175-80 feet. The well is 100 feet southwest of a small pumping well completed by the same operator last year. The pumper was recently abandoned. The area is about 3 miles southeast of Jermyn and 6 miles north of the Bryson field.

Jones County

The staking of a new wildcat on the Avoca trend, 3 miles southwest of the town of Avoca, centered the interest in Jones County. Bert Fields, operator in the Griffin pool of Jones County, staked No. 1 Dr. L. B. Gray, Section 41, Deaf and Dumb Asylum lands. It is located on the Avoca trend which includes the Ivy pool of northwestern Shackelford County, the Avoca pool and the Griffin pool.

(Continued on Page 96)

Kansas Developments

By DAL DALRYMPLE

Open Pool in Barton County; New Forest City Basin Test

A Barton County pool opener provided one of the highlights of Kansas field activity the past week, the discovery well being completed for daily potential of 559 bbls. of oil. It was the York State Oil Co. No. 1 Marchand, CEL NE NE Section 24-20-12w, about 4 miles south of the town of Ellinwood and about 1¼ miles southwest of the Clawson pool. The Hagen pool is about 1 mile south and 1 mile east of the new strike. The Marchand discovery well was bottomed at 3,320 feet in Arbuckle lime topped at 3,308 feet. It was given two-stage acid treatment.

Work was started at O. K. Supply Co. of Tulsa No. 1 Knabe, C NE NW Section 15-14-22, Johnson County, in the Kansas sector of the Forest City basin. It is to be a 1,600-foot or Arbuckle lime test. Location is about 2 miles northwest of the town of Gardner and some 25 miles southwest of Kansas City.

Extension of the Zenith pool of Stafford County one-fourth mile northeastward and into Reno County appeared imminent at A. M. Landon and others No. 1 Union Central, SW cor. Section 7-24-10w. It found Misener sand at 3,736 feet and recovered saturated cores at 3,736-39 feet and 3,743-44½ feet and operators were to core further. Location is on a 320-acre block.

The Wilkins and Schroeder pools in Ellsworth County were expected to be joined at Central Petroleum Co. No. 1 Frances, CEL NW Section 19-17-9w, midway between the two areas. Arbuckle lime was found at 3,240 feet and saturation was found in cores to 3,245 feet. The lime was found higher than in the nearest Wilkins pool producer. Operators were preparing to test. Location is on a Gulf Oil Corp. farmout.

Estimated Daily Production

Estimated daily production for Kansas for the week ending April 8, and for the preceding week was as follows:

	Barrels	
	April 8	April 1
Oxford City	1,025	1,050
Burrton	8,775	8,500
Ritz-Canton	5,775	5,525
Graber	2,175	2,950
Hollow-Nikkel	3,125	3,050
Lerado	675	875
Voshell	1,775	1,800
Wellington	2,275	2,200
Ellsworth County:		
Lorraine	1,600	1,750
Other pools	1,160	1,410
Rice-Barton counties:		
Bloomer	2,100	2,250
Chase	3,275	4,050
Geneseo	3,050	3,200
Raymond	600	500
Silica	9,850	11,225
South Silica	1,075	2,475
Keesling	475	1,300
Wherry	2,825	3,325
Miscellaneous Rice	7,150	8,475
Miscellaneous Barton	7,620	8,785
Russell County	23,650	24,450
Sedgwick County	3,825	3,700
Ellis:		
Bemis	6,375	5,975
Miscellaneous	2,690	3,475
Kingman County	660	645
Stafford County	4,730	7,725
Greenwood County	8,875	8,900
Butler County	19,450	19,775
Other fields	17,165	17,660
Total Kansas	153,800	167,000

Wildcat Operations

Barbara Oil Co. No. 1 Wilson, C SE Section 17-33-13w, which extended the Medicine Lodge field 1 mile westward, was completed, gauging 3,871,000 cu. ft. of gas daily. Production was from chat pay through perforations at 4,657-4,706 feet. It was plugged back from total depth of 5,201 feet when water intruded in the deeper formations.

Johnson and others No. 1-A Miltz, SW SW SW Section 24-17-4e, wildcat east of the Lost Springs pool in Marion County, found chat pay at 2,340-2,400 feet, total depth 2,485 feet, and pumped 5 bbls. of oil, with salt water.

Lloyd, Frost & Study No. 1 Jones, C E half Section 2-31-3e, wildcat in Cowley County, found Arbuckle lime at 3,348-57 feet, total depth, and was dry and abandoned.

W. E. Rennie and others No. 1 Williams, C S half SE SW Section 27-21-9w, Rice County wildcat, topped Misener sand at 3,438 feet, had a showing of oil and slight showing of gas in cores at 3,448-60 feet; a slight showing of oil and 1 bbl. of water an hour at 3,461 feet, based the sand at 3,462 feet and was bottomed at 3,469 feet. It was shot two times, 150 feet of oil rose in the hole in 48 hours, it bailed a small amount of oil but was dry and abandoned.

C. L. Carlock No. 1 Evans, SW SW SE Section 6-25-2e, wildcat about 3 miles northeast of the Goodrich pool in Sedgwick County, was drilling below 1,740 feet.

H. N. Greis & Kerlyn Oil Co. No. 1 Seyfert, SE SE SE Section 18-34-2e, Sumner County wildcat, was moving in material.

Cities Service Oil Co. No. 1 Dutt, SW SW NE Section 18-13-14w, was location for a wildcat north of the Atherton pool in Russell County.

Forrest Kelly and others are reported to have staked location for No. 1 Ryan, NE NE SW Section 24-16-22w, wildcat 2 miles east of Brownell in northeastern Ness County. Material was being moved in.

Power Oil Co. and others No. 1 Patten, NE cor. Section 26-4s-21w, is location for a wildcat in Norton County, some 25 miles northwest of the Faubion pool in Rooks County.

Barton County

Stanolind Oil & Gas Co. No. 5 Dick, C S half SW Section 2-20-11w, Silica field, Barton County, was completed in Arbuckle lime at 3,286-91 feet, total depth. It pumped 415 bbls. of oil in eight hours and made 24-hour potential of 1,246 bbls.

Sinclair Prairie Oil Co. No. 2 Prusa, C N half N

(Continued on Next Page)

New Tests Start in Forest City Basin and Southern Missouri

By STAFF CORRESPONDENT

ST. JOSEPH, Mo., Apr. 10.—Several new wildcat locations in the Forest City basin were announced the past week, including tests in Kansas and Nebraska as well as in northwestern Missouri. Other tests were drilling or preparing to start in northeastern and southeastern Missouri.

Birkett-Gillespie & Bradley Brothers staked location for a well in CSL N half NW SE Section 28-60-35w, about 2 miles northeast of Savannah in Andrew County, and about 15 miles northeast of St. Joseph. It is the first test for Andrew County and the first to be started by Bradley Brothers, who are among the pioneers in the Forest City basin lease play. Drilling is expected to be started by May 20. The same operators have a tentative location for a test in CSL SE NW Section 22-58-23w, near Chillicothe, in Livingston County, according to a report from Trenton.

O. E. King was reported to have staked location for a wildcat in SE cor. Section 13-55-32w, near Plattsburg in Clinton County, with operators preparing to move in machine.

Location for the first test in Mercer County was reported to have been staked by George W. Moore at No. 1 Castell, NE cor. Section 32-65-24w, near Princeton and about 12 miles south of the Iowa line.

The new Nebraska wildcat was the Golden Rod Oil Co. No. 1 Sparer, SE SE SE Section 8-11n-13e, in Cass County, southwest of Plattsmouth and about 18 miles south of Omaha. Operators were underreaming at 200 feet.

The new northeastern Kansas wildcat was the O. K. Supply Co. No. 1 Knabe, C NE NW Section 15-14s-22e, in Johnson County and about 25 miles southwest of Kansas City. It is to be an Arbuckle lime test.

The first of the northwest Missouri wildcats to be started in the current play, the J. H. Everitt and others No. 1 Spring, SW SW SE Section 30-62-38w, north of Mound City in Holt County, found Mississippi lime at 1,902 feet, it was reported, although operators are not giving out information. That checked 94 feet higher than that formation was found in the wildcat drilled near the town of Forest City some 10 miles southward several years ago. A showing of gas and two showings of oil previously had been unofficially reported to have been found in the No. 1 Spring.

The second Holt County test was expected to be started right away at Marcum and others No. 1 Gaffney, SW SW SE SW Section 24-63-40w, near the Atchison County line. Rig was on the ground.

Other northern and northwestern Missouri tests were: George Moore and associates No. 1 McQuate, NE NE SW SW Section 11-57-31w, De Kalb County, drilling; Frank Hopper and others No. 1 Black, NW NW NW Section 36-52-32w, Clay County, drilling; Eastern Drilling Co. No. 1 Williams, NW NW NE Section 28-53-32w, Clay County, spudding; H. V. Elwell No. 1 Taylor, SW NW NE Section 12-62-21w, Sullivan County, rig; C. E. Richardson and others No. 1 Jones, C NW NW Section 16-57-17w, Macon County, location; J. A. Turner and others No. 1 Rule, Section 20-53-33w, Platte County, location.

Farrar & Hopp No. 1 Gard, NW NW Section 21-46-28w, in Johnson County, southeast of Kansas City, was spudded last week by Jay Bradford & Son, contractors. The contract calls for two additional wells to be drilled on the Farrar & Hopp lease block.

In northeastern Missouri, Charles Delfeld and others No. 1 Turner, NW NW Section 27-59-9w, Shelby County, northeastern Missouri, found quicksand at 90 and 110 feet and were casing it off, preparing to drill ahead.

Deimund Oil Co. No. 1 Cooper, SE cor. Section 14-29-9e, in Bollinger County, near Cape Girardeau, southeastern Missouri, was bottomed at 1,268 feet in block lime and operators were running casing and setting packer to shut off water. Drilling was expected to be resumed this week.

Coastal Petroleum Co. No. 1 Bryant-Great Northern Land Co., SW Section 3-7-22, Butler County, southeastern Missouri, was moving in rig. Location was made by Basin Exploration Co. It is to be an Ordovician test, said to be the first to seek that level in southeastern part of the state.

half SE Section 20-16-11w. Prusa pool, was completed for daily potential of 2,954 bbls. of oil. Production was from Arbuckle lime at 3,289-3,300 feet, total depth.

Rice County

Gulf Oil Corp. No. 1 well in NW cor. Section 30-20-10w, Silica field, Rice County, penetrated Arbuckle lime at 3,301-10 feet, total depth, pumped 112 bbls. of oil and 89 bbls. of water in eight hours and made potential of 337 bbls., with 268 bbls. of water.

I. W. Murfin No. 1 Habiger, SW cor. Section 6-18-9w, Habiger-Stumps district, was dry and abandoned at 3,270 feet, total depth.

New activity in Rice County: Continental Oil Co. No. 1 Siemsen, NW SW NW Section 18-18-7w, rotary rig; Shell Petroleum Corp. No. 3-A Cramm, SW SW NE Section 15-19-9w, drilling ahead; Duwe & Farris No. 1 Hurt, NW NE NE Section 22-19-9w, building rotary rig.

Russell County

Phil-Han Oil Co. No. 1 Neidenthal, NW NE NW Section 13-14-15w, Gorham area, Russell County, topped Lansing-Kansas City lime at 3,045 feet, was bottomed in that formation at 3,054 feet, pumped 406 bbls. of oil in eight hours and made daily potential of 1,218 bbls.

W. I. Southern, Inc., No. 4 Meharg, NW NW NE Section 18-15-13w, topped Arbuckle lime at 3,276 feet, was bottomed at 3,283 feet, acidized with 8,000 gallons without success, and was abandoned.

First reports of new work in Russell County: Bridgeport Machine Co. No. 5-B Mills, SE SE SE Section 33-13-15w, building rig; Aylward Production Co. No. 4 Hall, SW cor. Section 22-14-14w, moving in material; Coralena Oil Co. No. 9 Deines, NE NW NE Section 36-15-14w, surface hole.

Stafford County

Stanolind Oil & Gas Co. No. 5 Hayes, C S half NW

(Continued on Page 96)

Illinois Fields

(Continued from Page 67)

feet, Roseclaire at 1,286 feet, drilling at 1,294 feet. Kesl and others No. 1 Salthoff, NE NE NW Section 12-6n-5w, drilling at 1,545 feet. Devonian Oil & Gas Co. No. 1 Ambuell, NE SW NW Section 22-6n-4w, drilling at 1,695 feet. Reisig and Quisenberry No. 1 Wilderman, SW cor. NE NE NE Section 3-6n-3w, total depth 1,340 feet, cleaning out to drill deeper.

In Effingham County, Kingwood Oil Co. No. 1 McWhorter, C E half SE NW Section 15-6n-6e, old total depth 5,823 feet, top of cement plug 3,009 feet, drilling cement at 3,400 feet to make a deeper test.

In Edgar County, A. M. Myers No. 1 Brinkerhoff, C SE SE Section 26-13n-13w of second principal meridian, drilling below 1,800 feet.

In Coles County, Texas Canadian Oil Co. No. 1 Millar, C SE SW Section 3-12n-8e, shut down for orders at 2,158 feet; Benoist sand at 2,143 feet, cored dry from 2,146 to 2,155 feet. Wheless and others No. 2 Michaels, SE SE NE Section 2-11n-7e, total depth 3,307 feet, top of Devonian at 3,252 feet, hard tight lime to bottom; acidized with 1,000 gallons, with an 80-bbl. load; kicked out part of the load and swabbed down, recovering very little net oil; will reacidize.

In Clark County, Phillips & Kost No. 1 Shuey, NW SE SE Section 31-12n-14w of second principal meridian, small showing of oil 460-505 feet, reported to have bailed 12½ bbls. of oil; will shoot or acidize. Kingwood Oil Co. No. 1 Miller, SE NE NE Section 36-11n-12w, rig up. H. R. Snavely No. 1 Scholfill A, SE NE SE Section 6-11n-11w, shut down at 855 feet.

In Shelby County, Corn and others No. 1 Wabash R. R., C N half N half Section 27-10n-5e, total depth 1,951 feet, pumping 20 bbls. of oil per day, pumping at intervals. It pumps down in approximately three hours. May be drilled deeper. Harris and others No. 1 Skinner, NW NW NW Section 29-10n-1e, drilling below 1,060 feet. M. B. Hughes No. 1 Carr, C SE NE Section 12-13n-2e, plan to start operations this week. Independent Refining & Producing Co. No. 1 Hackenburg, SE SW SW Section 20-12n-2e, total depth 1,652 feet, may be drilled deeper. Kingwood Oil Co. No. 1 Trueblood, SW SW SW Section 3-9n-5e, location.

In Perry County, Lundy and Winkler No. 1 Stern, NW NW NE Section 8-4s-3w, drilling at 975 feet. Robinson and others No. 1 Springer, NE cor. SW NW Section 18-4s-8e, shut down at 3,608 feet. E. J. Shaefer No. 1 Sprague, SW NE NW Section 33-5s-4w, shut down for pipe at 770 feet. G. H. Blankenship No. 1 Rheinecker, NW NW NE Section 3-6s-4w, fishing at 1,175 feet.

In Jefferson County, McQueen and others No. 1 Sorenson, NE NE NW Section 5-2s-2e, will underream 6-inch pipe from 1,817 to 1,894 feet. Armstrong and others No. 1 Scott, SE NW SE Section 23-3s-2e, coring at 2,835 feet, Fredonia lime topped at 2,830 feet.

CENTRAL OHIO

NEWARK, Ohio, Apr. 10.—In the Central Ohio area, Ashland County yielded a shallow oil well with a 30-bbl. initial production. In Stark County, two gas wells were completed, each with an open flow of better than 2,000,000 cu. ft.

Ashland County, Lake Township, J. H. Hogue No. 1 Fred Mosher, Section 22, made 30 bbls. of oil the first 24 hours after a shot, along with 100,000 cu. ft. of gas, from the Berea sand at 591-660 feet.

Athens County, Canaan Township, Sperry Oil & Gas Co. No. 2 Emma Poston, Section 11, is good for 200,000 cu. ft. open flow of gas from the second Cow Run sand at 501-17 feet.

Guernsey County, Millwood Township, W. R. Corey No. 1 Isaac A. Hall, Section 19, had only a small showing of gas in the Berea sand at 1,434-38 feet and was abandoned after two shots failed to increase the flow.

Medina County, Chatham Township, Pearsal & Lance No. 1 Clyde A. Clapp, Lot 4, Tract 17, gauged 235,000 cu. ft. open flow at 441-57 feet.

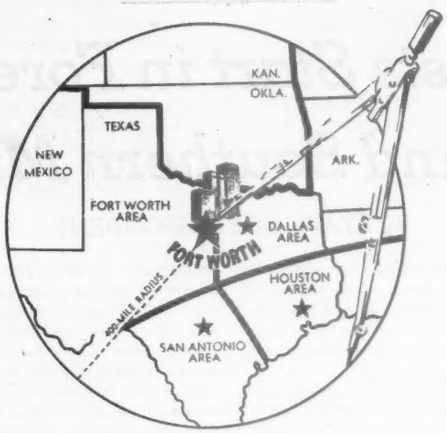
Meigs County, Rutland Township, T. J. Chase No. 2 N. P. Mills, Section 13, is dry in the Maxton sand; total depth 788 feet.

Stark County, Jackson Township, Obermiller Brothers No. 1 F. Turner, Section 1, gauged 2,200,000 cu. ft. of gas, open flow, from the Clinton at 4,451-56 feet. Lake Township, White Co. No. 1 Simon Werstler, Section 33, a Clinton sand gas well good for 2,300,000 cu. ft. open flow at 4,550-91 feet.

Lima Field

Northwestern Ohio reports one completion. Charles Shaw and others No. 1 Maude Zooler, Section 26, Clinton Township, Seneca County, is a 2-bbl. pumper in the Trenton lime at 1,757-62 feet. The same operator has staked a No. 2 location 800 feet northeast of No. 1 on the same farm.

LOANS to produce and market Black Gold



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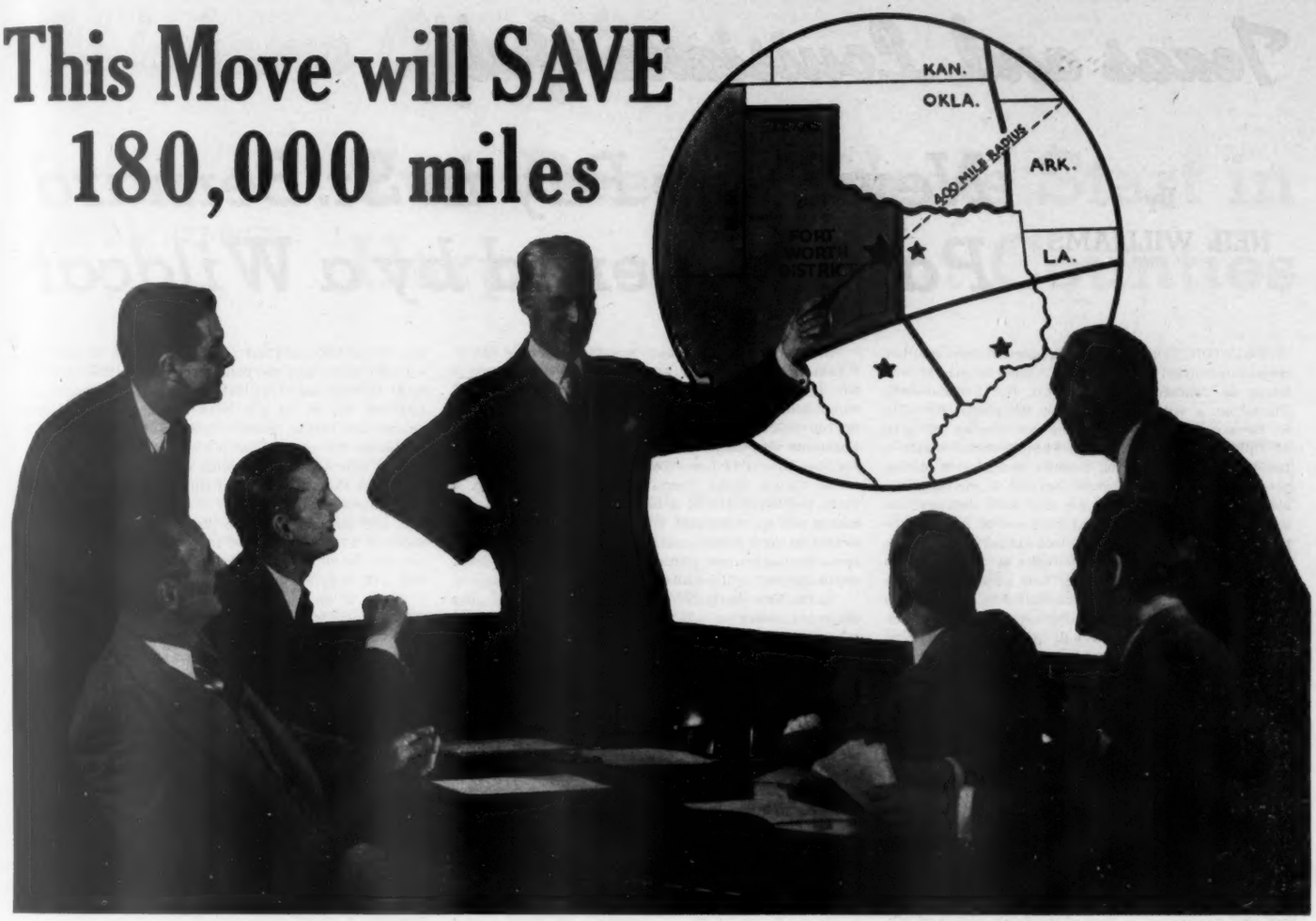

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*New wells in Mid-Continent, 1938, 17,010; in Fort Worth area, 6,313. The Oil and Gas Journal.

CHAMBER of COMMERCE

FORT WORTH

Heart of the Mid-Continent Area

Texas and Louisiana Gulf

By
NEIL WILLIAMS

New Deep Pay in St. Bernard Parish Opened by a Wildcat

HOUSTON, Tex., Apr. 10.—Production from another deep-seated structure was being opened in coastal Louisiana as Vendome Petroleum Co. No. 1 Kenilworth Plantation, a wildcat east of the Mississippi River in St. Bernard Parish, was cleaning out, flowing 480 bbls. of fluid daily through a 13/64-inch choke under a tubing pressure of 1,000 pounds and shut-in casing pressure 800 pounds. A shake out test at the separator showed the well making 35 per cent basic sediment and salt water, 5 per cent drilling mud and 60 per cent 34-gravity oil. This well has been looked upon as a possible pool opener for the past few weeks as a result of an electrical survey which showed four possible oil sands below 10,000 feet. The hole was drilled to a total depth of 11,469 feet, and 7-inch casing cemented on bottom. Two production tests through perforated casing at 11,200-20 feet, and at 10,948-58 feet, developed salt water and the latest test was made after plugging back to 10,736 feet. In view of the salt water showing and the low gas pressure it is possible that the well may be killed and the casing reperforated before the well is officially completed. This is the first well drilled on the company's block of several thousand acres, centering around Section 59-13s-14e.

Two outposts to the Eola field, Avoyelles Parish, were holding the attention of operators. Approximately 2,000 feet northeast of the discovery well, Pomo Production Co. No. 1 Sentell was coring for the pay below 8,450 feet. While the well is reported running approximately 30 feet lower than the discovery well, it is expected to produce in view of the thick section of Wilcox (Tertiary) sand. J. Edward Jones No. 1 Haas Investment Co., 3,000 feet southeast of production, is drilling below 6,200 feet, and is reported checking about normal with the discovery well. About a mile east of production, the same operator purchased from Roper & Todd the Sam Barone 96-acre lease for $15,000 cash and a 1/24th and 1/96th override.

On the Cheneyville dome, Rapides Parish, Sid Richardson No. 1 Well Co., Inc., Section 55-1s-2e, topped the Cockfield sand at 5,936 feet, and is drilling for the Wilcox sand below 6,735 feet. In the same area and in Section 4-1s-2e, Texas Canadian Oil Co. No. 1 Myrtle B. Pope is drilling in sandy shale below 5,417 feet.

Wildcat Failure

Gulf States Exploration Co. No. 1 Erwin & Bishop, a wildcat in Section 35-1n-3w, has been abandoned in the Wilcox sand at 7,523 feet. This is the first wildcat to reach this horizon since the discovery of the Eola field. In the same parish, E. J. Gann and others are rigging up No. 1 Lee Lumber Co. in Section 9-5n-3e. This hole was abandoned several months ago after drilling to 140 feet.

In Evangeline Parish, location for a wildcat was announced by Continental Oil Co. and others for No. 1 Mrs. Lillie Manuel, 2,040 feet southeast along the northeast line of Section 33 from the north corner, thence 580 feet southwest at right angles in Township 4s-1w. This area is known as the Reddel prospect on which two dry holes were drilled by Humble Oil & Refining Co. which is also interested in the present test.

Location for five more South Louisiana wildcats were reported. T. G. Markley staked location for No. 1 M. L. Vincent in Section 19-17s-1w, Acadia Parish. In Assumption Parish, Shell Oil Co. is moving in material for No. 1 Ellis, Section 66-16s14e, on the Amelia prospect, southeast of the Gibson field and east of Lake Palourde. In East Baton Rouge Parish, Danciger Oil & Refining Co. made a location for No. 1 D. E. McInnis in Section 58-7s-1e, while in Jefferson Davis Parish R. M. Bleakie and others have rigged up for No. 1 Lack-Moore Co., Ltd., in Section 29-7s-6w. In Lafourche Parish, J. Perry Scranton is building road for No. 2 Martinez, Section 132-15s-17e.

In the Charenton field, St. Mary Parish, J. P. Scranton opened a new sand with the completion of No. 1 State-Bayou, Section 30-13s-10e. The well was completed at 7,896 feet for an initial daily production of 700 bbls., flowing through a quarter-inch choke. Locations were made by Pan American Production Co. for Nos. 13 and 14 Laws Realty Co. and No. 13 Veeder.

At Fausse Point, Iberia Parish, Texas Co. No. 5 State, Section 35-11s-8e, is bottomed at 12,125 feet, and casing will be cemented. This is the deepest hole ever drilled on the structure and the casing is being cemented for a production test, although it is not known at what depth the test will be made.

In the New Iberia field, Iberia Parish, Texas Co. has cemented casing at 9,283 feet in No. 1 Renaudet and others, preparatory to making a production test of a new sand at 8,930-70 feet. This well topped salt at 9,293 feet and drilled the formation to a total depth of 9,313 feet. The same company's No. 2 Gonsoulin, Section 13-12s-7e is drilling in shale below 9,800 feet.

South Roanoke Field

Distillate production in the South Roanoke field, Jefferson Davis Parish, was extended about a quarter of a mile south with the completion of Continental Oil Co. No. 2 Sturdivant. The hole is bottomed at 9,920 feet and the well was completed in a sand section at 9,884-9,909 feet for an initial production of 98 bbls. in 14 hours, flowing through a 5/32-inch choke.

In the Villa Platte field, Evangeline Parish, Contintental Oil Co. No. 1 Tate is drilling in the Wilcox sand below 10,350 feet with no showing reported. The top of the Wilcox formation was not reported. Production in the field is developed from two sands in the Sparta formation at approximately 8,800-9,100 feet.

Texas Coast

The abandonment of several tests in semi-proven areas and the disappointing showing of an important wildcat in Brazoria County provided the Texas Gulf Coast with a quiet week of developments.

In the Algoa area, Brazoria County, Crosby Drilling Co. No. 1 George Wilson was shut down at the close of the week waiting for orders after the well flowed salt water when tested through perforated casing at 9,463-69 feet. The casing may be perforated a few feet lower or the hole may be plugged back and a test made at 8,839-83 feet where broken sand with a gas and distillate odor was logged.

The revival of drilling activity in the Satsuma field, Harris County, following the recent completion of Williams & Gillespie No. 1 Behne, one-half mile north of production, was short lived, as three offsets to the producer have cored below the producing horizon without finding production. Amerada Petroleum Corp. and others No. 1-A W. S. Jacobs, a west offset, topped salt water sand at 6,896 feet and is shut down at 6,908 feet. Offsetting the extension producer to the north, Cron & Gracey and others No. 1 Zagist is drilling in shale below 6,888 feet with no showing and is expected to be abandoned. Northeast of production, H. E. Williams and others No. 1 Cruice was abandoned at 7,000 feet. A small section of sand with a showing of oil was recovered in the 6,800-foot horizon, but the showing did not warrant testing.

In the Francitas field, Jackson County, Mills Bennett Production Co. No. 1 Lowrence, Block 36, J. D. Newell Survey, is coring deeper after two drill-stem tests at 7,435-54 feet, and 7,465-70 feet, tested 325 pounds of pressure, 150 feet of fluid, 20 feet of distillate and 130 feet of salt water. Crosby Drilling Co. No. 1 Kopnicky, southeast of production, is drilling in sand below 7,684 feet.

Sun Oil Co. No. 1 Cavallin, the discovery well of a new gas field, east of Palacios in Matagorda County, flowed 150 bbls. of fluid per day of which 75 per cent was salt water and the balance distillate. The test was made through an 11/64-inch choke and the well tested 2,040,000 cu. ft. of gas with tubing pressure 3,800 pounds and casing pressure 3,900 pounds. The well is producing through perforated casing at 8,940-65 feet.

One mile east of production in the Turtle Bay field, Chambers County, Stanolind Oil & Gas Co. No. 1 Mrs. Tassie Lots cored salt water sand in the Frio at 6,700 feet, and the hole has been plugged back from a total depth of 6,777 feet to 6,590 feet where a drill-stem test was scheduled to be made in the Marginulina formation. The well is given little chance of producing.

North of the Cali field, Newton County, Sun Oil Co. No. 1 Peavy Moore Lumber Co. was drilled to a corrected depth of 7,700 feet and the hole has been plugged back to 7,010 feet, preparatory to sidetracking and recoring from 7,500 feet. Sand with a slight oil odor was logged in the original hole at 7,507-08 feet.

One mile west of the discovery well of the Northwest Conroe gas field, Montgomery County, Housh & Thompson No. 1 Graham cored salt water sand in the Cockfield formation and the hole is expected to be abandoned or carried to the Wilcox sand. At the close of the week the hole was below 4,760 feet and the operators were scheduled to drill about 100 feet deeper before the well is shut down.

In Chambers County and located in the Smith Point area, Housh & Thompson staked location for a Frio sand test on the Robbins lease in the Edwards T. Branch Survey.

In the Ace field, Polk County, and offsetting Peytong Brothers' Wilcox sand producer, Shell Petroleum Corp. was scheduled to make a series of production tests in No. 1 Doucette. The hole is bottomed at 8,555 feet and casing has been cemented. The well has failed to show up favorably on several drill-stem tests.

Location for another wildcat in Harris County was made by J. H. Woodard, Jr., for No. 1 Miller Estate. The well is located in the John Skorupski Survey, between Westfield and Humble, and will be drilled to the Cockfield formation.

TEXAS GULF COAST COMPLETIONS IN PROVEN FIELDS

Brazoria County

Hastings field: Stanolind Oil & Gas Co. No. 10-C Hiram Moore, perforated casing 6,838-58 feet, 713 bbls., quarter-inch choke. Stanolind Oil & Gas Co. No. 9 Autrey, perforated casing 6,028-42 feet, 730 bbls., quarter-inch choke. Humble Oil & Refining Co. No. 6 Lerew, sand 6,060-80 feet, 433 bbls., quarter-inch choke. Lockridge field: Dr. C. M. Lusk No. 6 State, perforated casing 6,365-66 feet, 215 bbls., eighth-inch choke.

Chambers County

Anahuac field: Gulf Oil Corp. No. 1 Peterson, 7,125 feet, 626 bbls., quarter-inch choke. Barbers Hill field: Texas Gulf Producing Co. No. 27-B Kirby, sand 5,040-5,198 feet, 501 bbls., quarter-inch choke. Turtle Bay field: Stanolind Oil & Gas Co. No. 5-40 State, sand 6,598-6,602 feet, 105 bbls., eighth-inch choke.

Galveston County

Dickinson field: Humble Oil & Refining Co. No. 5 J. N. Fream, 8,102 feet, 768 bbls., quarter-inch choke. J. W. Frazier No. 2 Shady Acres Subdivision, 7,719 feet, 600 bbls., quarter-inch choke. Fairbanks field: Amerada-Stanolind Oil & Gas Co. No. 2 Chancey, perforated casing 6,842-44 feet, 183 bbls., eighth-inch choke. Amerada-Stanolind Oil & Gas Co. No. 11 E. W. Mills, perforated casing 6,849-53 feet, 141 bbls., eighth-inch choke. Amer-

(Continued on Page 96)

Oklahoma Operations

By
DAL DALRYMPLE

Two Deep Wildcats Start in Harper and Grant Counties

The search for oil reserves was extended far into northwestern Oklahoma the past week when Sinclair Prairie Oil Co. staked location and began digging cellar and pits at No. 1 George, NE NE SW Section 5-27-23w, west of Buffalo, in Harper County. It is the third test to be drilled by the company on a large block assembled several years ago. The first wildcat to be drilled, the company's No. 1 Howell, C SW SW Section 14-26-24w, found 11,000,000 cu. ft. of gas daily after plugging back from 8,590 feet, total depth, to about 5,400 feet. The gas was piped to the town of Laverne for a local supply. The second test to be drilled in the block, in NW NW SE Section 21-26-24w, had a junked hole and was abandoned at 7,368 feet, total depth.

Carter Oil Co. has started work at No. 1 Staggers, CW½ SE NW Section 4-25-3w, northwest of the Lamont pool in Grant County. Material was being moved in.

English & Morgan No. 1 Lee, NW NW SE Section 36-2n-19w, wildcat near Headrick in Jackson County, gave promise of opening a new oil pool. It found sand at 1,280 feet, drilled to 1,332 feet and had some free oil in the hole, according to field reports. Operators were to bail and may deepen before testing. Location is on a 2,280-acre block.

A new Prue sand pool will be opened in southwestern Creek County if efforts to complete a producer in that formation are successful at Burke-Greis Oil Co. and others No. 1 Vanderslice, NE NE SE Section 30-14-7. The wildcat topped Prue sand at 2,840 feet and was bottomed at 2,893 feet, with casing set at 2,830 feet. Operators were drilling plug and were to clean out and shoot. Location is about 3 miles southeast of the Sac and Fox pool in Lincoln County, currently the most active Prue sand pool in the state.

Two wells were near completion in the Meridian pool, Logan County. Sinclair Prairie Oil Co. No. 2 Crews, NE SW NE Section 27-16-1e, northeast of the discovery well and reported checking slightly higher than that test, set 7-inch casing at 5,122 feet, total depth 5,130 feet. Plug was being drilled. Helmerich & Payne, Inc., and others No. 1 Henderson, SE SE NW Section 27-16-1e, west offset to the discovery well, has had showings of oil and gas and was drilling ahead below 5,040 feet. Completion of these tests as producers would give the pool its second and third oil wells. Two gas wells have been completed.

Wildcat Failures, First Reports

Grimes and others No. 1 Dye, NW NW SE Section 2-5-5, Seminole County wildcat, topped Hunton lime at 2,660 feet, Wilcox sand 3,355 feet, total depth 3,379 feet, plugged back to 2,850 feet, drilled out to 2,920 feet, was shot at 2,870-2,910 feet, but was dry and abandoned.

M. A. Saunders and others No. 1 Vanderslice, C SW SW Section 25-2n-2e, Garvin County, cored at 3,001-05 feet, total depth, recovered 4 feet of Arbuckle lime, and was dry and abandoned.

R. O. Ray No. 1 Madison, NW NW SW Section 11-2s-16w, wildcat north of Hollister in Tillman County, found Granite at 1,880 feet and was dry and abandoned at 1,894 feet, total depth.

J. Garfield Buell No. 1 Madgett, SE SW SE Section 15-10-5, was location for a wildcat in Pottawatomie County.

Pure Oil Co. No. 1 Fuqua, SW SW NE Section 18-6-16w, had machine on ground. This wildcat is about 9 miles southeast of Hobart, Kiowa County.

Russell S. Tarr No. 1 Kelsay, SW SW NW Section 20-7-17w, wildcat in the Komalty district, Kiowa County, was a location.

Ben Curtis No. 1 School Land, SE SW SW Section 3-1n-5w, was location for a wildcat west of the Doyle area, Stephens County.

Pontotoc County

One of the larger Fitts field producers of recent months was completed at Patsy Oil Co. No. 1 Bates, NW NE SW Section 26-2n-7e, Pontotoc County. It topped Hunton lime at 3,835 feet, was bottomed at 3,943 feet, was acidized with 6,000 gallons and made 24-hour potential of 3,864 bbls. of oil.

Senora Oil & Gas Co. No. 2 Cox, SE NW NW Section 17-5-5, Bebee area, found Viola lime at 2,428 feet, total depth 2,543 feet, was treated with 3,500 gallons of acid and pumped 70 bbls. of oil daily.

Magnolia Petroleum Co. completed No. 2 Chandler Estate, NW NW NE Section 35-5-7, East Ada district, for 10,000,000 cu. ft. of gas daily. It topped Gilcrease sand at 2,182 feet, total depth 2,190 feet.

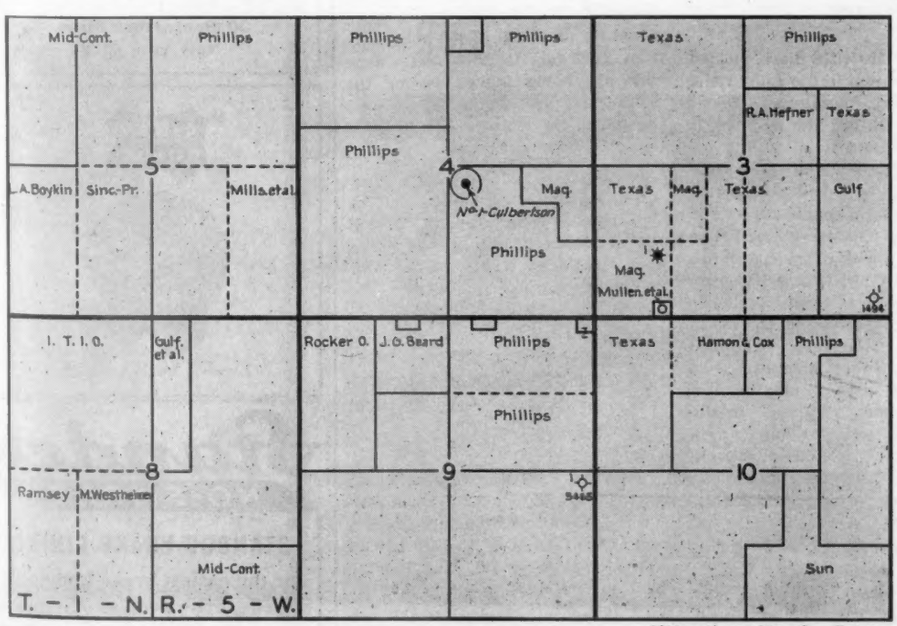
Superior Oil Co. No. 1 Summers, NE NW NW Section 36-5-4, had Viola lime at 2,406 feet, total depth 2,591 feet, was acidized with 3,000 gallons, and had initial production of 212 bbls. of oil.

The following new operations in Pontotoc County were reported: Vierson Oil & Gas Co. No. 2 Community, NW SW SW Section 25-5-7, drilling ahead; Simpson & Roodhouse No. 1 Statler, NE SW SW Section 34-2n-7, building rig; Continental Oil Co. No. 5 House, SW NE SE Section 12-1n-7, Jesse area, location.

Estimated Daily Production

Estimated daily production for Oklahoma for the week ending April 8, and for the preceding week, was as follows:

	Barrels	
	April 8	April 1
Allen	5,775	5,825
Billings	5,350	5,300
Burbank	7,625	7,650
South Burbank	9,300	9,350
Balance Osage	18,250	18,300
Blackwell district	3,975	4,050
Bristow-Slick	6,975	6,850
Chandler	1,650	1,625
Crescent	3,125	3,050
Cromwell	3,075	3,050
Cushing-Shamrock	9,950	10,150
Duncan district	3,925	3,800
Edmond	4,725	4,650
Fish	3,225	3,450
Fitts	30,325	30,050
Jesse	2,225	2,275
Graham-Fox	4,350	4,250
Gray	875	900
Healdton	9,050	9,025
Hewitt	3,575	3,600
Keokuk	3,750	3,600
Konawa	1,100	1,125
Lucien	8,250	8,325
Moore	3,725	3,675
Oklahoma City	114,500	85,025
Olympic	3,400	3,325
Ramsey	3,550	3,575
Sasakwa	1,350	1,375
Sholem-Alechem	2,300	2,325
Seminole district:		
Bowlegs	8,200	8,225
Carr City	3,050	3,000
Dora	4,300	4,325
Earlsboro	4,725	4,750
South Earlsboro	550	525
East Earlsboro	4,225	4,175
Little River	7,350	7,425
East Little River	825	800
Maud	1,150	1,100
Mission	1,525	1,475
Seminole	7,725	7,600
East Seminole	1,500	1,475
Searight	2,350	2,375
Total Seminole	47,475	47,250
St. Louis-Pearson	29,675	29,750
Tatums	1,925	1,950
Tonkawa-Garber-Thomas	4,000	4,025
Wewoka	2,075	2,050
Yale-Jennings	3,600	3,625
Other pools	84,250	84,000
Total Oklahoma	452,250	422,200



Midcontinent Map Co., Tulsa

Phillips Petroleum Co. continued to swab and test No. 1 Culbertson, Section 4-1n-5w, Stephens County pool opener. It was producing from 100 to 150 bbls. of oil during daylight test from total depth of 5,606 feet in Deese sand

Pottawatomie County

Harry Schaffer No. 1-B Zoeller, NW NW SW Section 5-6-5, St. Louis field, Pottawatomie County, topped Simpson formation at 4,150 feet, was bottomed at 4,348 feet, and completed for 153 bbls. of oil daily.

Magnolia Petroleum Co. No. 3 Jordan, SE NE SW Section 12-7-4, plugged back from total depth of 3,997 feet to 3,300 feet, but was dry and abandoned.

J. E. Trigg No. 1 Truesdale, SW SW SE Section 21-

(Continued on Page 84)

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Among the Drilling

HOUSH & THOMPSON will move in a rotary within the next few weeks to the Smith's Point area in Chambers County, Texas, for a Frio sand test to be drilled on the Robbins lease in the Edward T. Branch Survey. In the Iowa Colony area, Brazoria County, No. 1 Lula Allen is drilling in shale below 4,400 feet. West of the West Conroe area, Montgomery County, No. 1 Graham is scheduled to be abandoned at 4,820 feet after salt water sands were cored in the upper and lower sections of the Cockfield formation.

CROSBY DRILLING CO. No. 1 George S. Wilson, a wildcat in the Algoa area, Brazoria County, Texas, was scheduled to be retested after the well showed salt water on a production test through perforated casing at 9,463-69 feet. In the Francitas area, Jackson County, No. 1 Kopnicky, southeast of production, is drilling in sand below 7,684 feet.

SMITH & McDANNALD No. 1 Limberg, midway between the Magnet and Withers field, Wharton County, Texas, is being completed as a producer at a total depth of 5,545 feet. Two other operations are reported in the Withers field, while a new operation is being started on the southwest flank of the Danbury dome in Brazoria County. The well is on the A. P. Haury lease in the H.T.&B. Survey.

ALLEN & MORRIS have started a second operation in the Luby field, Nueces County, Southwest Texas, for Seaboard Oil Co. The new test is No. 3 Wilson and it is drilling below 4,173 feet. For the same company, No. 50 Luby is being completed for a producer through perforated casing at 5,058-62 feet. In the active McCampbell field, Landrum-Jones Oil Co. No. 1 Conn Brown has been completed for a good producer through perforated casing at 7,133-36 feet, while in the same field, Joe Morris No. 1 Sweet is scheduled to be completed after cementing casing on bottom at 7,173 feet. In the La Rosa field, Refugio County, Coronado Corp. No. 20 Rooke is being completed at 5,898 feet, while two other operations are reported for the same company on the Yarrow and Michna leases.

RUTHERFORD DRILLING CO. completed No. 1 Oppenheimer in the Bonnieview field, Refugio County, Texas, as a gas well. The well was drilled jointly with the Royal Oil & Gas Co. and was completed at approximately 4,100 feet after plugging back from a total depth of 6,505 feet.

DRILLING & EXPLORATION CO. has staked the most eastern test to the Vacuum area of northwestern Lea County, New Mexico. It is on acreage farmed out from the Shell Oil Co. and is the company's No. 1-W State, 2,310 feet from the south and east lines of Section 26-17-35. Drilling & Exploration also was reported to have staked its No. 1-M State, 1,890 feet from the east and 660 feet from the south lines of Section 29-17-35, also on acreage farmed out from Shell.

GEORGE W. FORD & SON, contractors of San Angelo, Tex., have been given contract for the Rice P. Lynn and Ralph Cobb No. 1 X. B. Cox in the southwestern corner of the Valentine Mueller Survey 176, Tom Green County. Location is near the first test drilled for oil in West Texas, by W. S. Titus in 1888, 1 mile south of the Santa Fe Railroad tracts southwest of the town of San Angelo. Contractor is rigging up spudder and the test will start immediately.

PARKER DRILLING CO., Fort Worth, Tex., has completed one well in Crane County, West Texas, and is preparing to drill two more in Ector County. The completion is the company's No. 1 King-Texas, completed for an initial of 450 bbls. daily from 2,043 feet to 2,135 feet. Materials are being moved in for the drilling of Nos. 1 and 2 Ida McDonald, in the Harper pool of Ector County, West Texas.

HELMERICH & PAYNE, INC., Tulsa, No. 1 Henderson, in SE cor. NW of Section 27-16-1e, in the Crews area, of Logan County, Oklahoma, had stuck drill pipe at 5,002 feet.

NOBLE DRILLING CO., Tulsa, is drilling for Pure Oil Co. at No. 1 Noble, NE SE Section 35-3s-1e. The well is 6,853 feet in sand with slight oil stains reported.

DUWE & FARRIS, Wichita, Kans., No. 1 Weins, SE SE NE Section 6-19-9w, topped siliceous lime at 3,234 feet and at total depth of 3,240 feet, with only slight odor of oil, was plugging back to test the Lansing at 3,079 to 3,091 feet.

CAMPBELL DRILLING CO., Tulsa, has staked location for the No. 1 Killingsworth, in NW NE SW of Section

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Contractors

14-9-6e, in the Seminole pool of Seminole County, Oklahoma. The Hunton lime will be the goal.

E. W. HUGHES DRILLING CO. and others No. 1 Meisner, in NE NW of Section 10-20-4w, revived the old Brown pool of southeastern Garfield County, Oklahoma. The well is averaging around 300 bbls. of oil a day, flowing through casing. It was deepened from 5,921 to 5,944 feet, present total depth.

HALCO-MEYER DRILLING CO., Wewoka, drilling in SE NE SW of Section 27-25-1w, in the Tonkawa area of Kay County, Oklahoma, on a farmout from the Texas Co., is to get spudded right away.

WALSH DRILLING CO., Odessa, Tex., has received contract from Gulf Oil Corp. for the drilling of its second deep test on its several thousand-acre block in Garza and Crosby counties. The new deep test is Gulf Oil Corp. No. 1-C Swenson, in the center of the northwest quarter of Section 95, Block 2, H.&G.N. Survey, in the southeastern part of Crosby County, West Texas. The test is near the northwest edge of the large Swenson ranch, which Gulf has leased in units of 95 quarter sections. The new test is in Unit 2. Walsh Drilling Co. drilled the first test on the ranch, No. 1-B Swenson, which was recently temporarily abandoned at a plugged-back depth of 7,400 feet from 8,104 feet. Derrick is up and materials are being moved in for immediate drilling of the new test.

KERR-LYNN, Oklahoma City, and Indian Territory Illuminating Oil Co. Saturday announced the staking of location for a 6,000-foot partnership wildcat at No. 1 Lambert, 660 feet south and 330 feet west of the NE cor. of E half NE of Section 6-5n-2e, or one well to the 20 acres. This means that the search for a major pool in southwestern Pottawatomie and southeastern Cleveland counties, Oklahoma, and bordering north of the Canadian River in the Panhandle of McClain County, is to be renewed. Located west of Wanette and northeast across the river from Ragsdale, it will look for the Wilcox sand around 6,000 feet and drilling will be spudded in within two weeks. Each of the partners owns 50 per cent of the 80-acre drilling site, with Kerr-Lynn having some adjoining acreage and the I.T.I.O. approximately 1,100 acres nearby. In the Davis-Wynnewood sector of Garvin County, Oklahoma, Kerr-Lynn No. 1 Butterly in NE cor. SE of Section 22-1n-1e, northwest of Davis, was drilling in hard shale below 3,600 feet.

COOPER DRILLING CO., Shawnee, No. 1 Coughlin, in SE NE SW of Section 30-25-1e, in the Tonkawa sector, in Kay County, Oklahoma, was drilling ahead at 3,100 feet after being shut down for motor repairs.

At Vendome Petroleum Corp. No. 1 Kenilworth, St. Bernard Parish, Louisiana: Mrs. William Rodgers; William Rodgers; Dewey Price, superintendent; Mrs. Dewey Price; E. J. Gore, helper; J. J. Norris, derrick man; Norman Henry, driller; D. D. Tipton, helper; G. D. Robbins, helper; A. A. Perkins, fireman.

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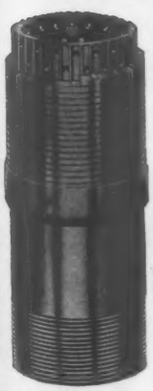

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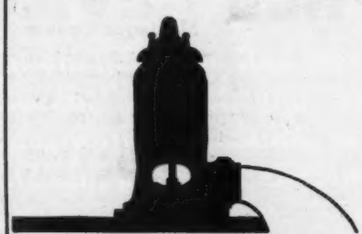

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North and East Texas

By
D. H. STORMONT

Walnut Bend, Cooke County, Promised Increased Activity

WICHITA FALLS, Tex., Apr. 10.—A continuous drilling campaign expected to include some 18 wells was in sight for the Walnut Bend field of northern Cooke County. Cox & Hamon, Dallas independent operators, announced that they had acquired a 279-acre farmout from the Texas Co., offsetting the discovery lease. The acreage is divided into two tracts, being the William Neu tract of 124 acres east of production in the B.B.B.&C. Survey, Abstract 180, and the W. H. Neu tract of 155 acres south of production in the J. O. Henderson Survey, Abstract 1261. Two wells are expected to start on the acreage immediately to protect the lease from drainage expected at the two wells being drilled by Sinclair Prairie on the J. M. Best tract to the west. The south side tract has not yet been offset although Sinclair Prairie has production some two locations north.

Several miles south of the Walnut Bend area, Cliff Camp Drilling Co. No. 1 Lynch is reported drilling ahead after being shut down for repairs at 3,050 feet. Also in Cooke County, possibility was seen for another new shallow Ordovician oil pool when Ross & Co. No. 1 Bailey Inglish, in the G. W. McGown Survey, 8 miles southwest of the town of Muenster, shut down to cement casing on top of oil sand at 1,620-28 feet. Shale showing oil was drilled from 1,628 feet to 1,635 feet, total depth, and casing is being cemented at 1,612 feet. The test is 5 miles southwest of Whitfield, Pearson & Grimes No. 2 B. Voth, 2 miles south of Muenster, which gave Cooke County its first Ellenburger pool with a 500-bbl. well.

Montague County

The discovery well of the Bonita Strawn sand pool of Montague County has been deepened in search of further production and was last reported cleaning out after a shot in the section some 30 feet below the discovery horizon. The test was deepened after a south offset, Continental Oil Co. and United Producers Co No. 1 Langford, Block 47, had found a larger pay section lower than the original total depth of the discovery. The well was deepened from 2,898 feet to 2,928 feet with spudder, logging a hard oil sand from the old total depth to 2,925 feet, giving the well a pay section from 2,887 feet to 2,925 feet. In the work of completing No. 1 Langford, the pipe collapsed at 2,980 feet following a nitroglycerin shot. Operators are attempting to swage the collapsed casing.

Archer County

After more than a year following its discovery, the one-producer Scotland pool of eastern Archer County, is receiving its second test. The discovery well and acreage of the Adams Oil & Gas Co. was purchased by the Deep Oil Development Co. and that company has staked No. 1 A. Schlabs, 330 feet from south and west lines of Lot 2, Block 3, Clark & Plumb subdivision, a north offset to the discovery well, Adams Oil & Gas Co. No. 1 Moer. Three miles south of Scotland and 4 miles southwest of the Scotland area, the Kadane Oil Corp. has derrick up for No. 1 Hemmi Estate, Lot 60, Block 3, Clark and Plumb subdivision. Contract depth on this test is 5,600 feet.

North offset to the discovery well in the Griffin area, northern Archer County, E. P. Griffin No. 2 Waggoner, Section 3, H.&T.C. Survey, cored dry broken sand from 4,360-73 feet and was coring below 4,377 feet. Allowing for differences in elevation, this test should have picked up the discovery horizon at about 4,360 feet.

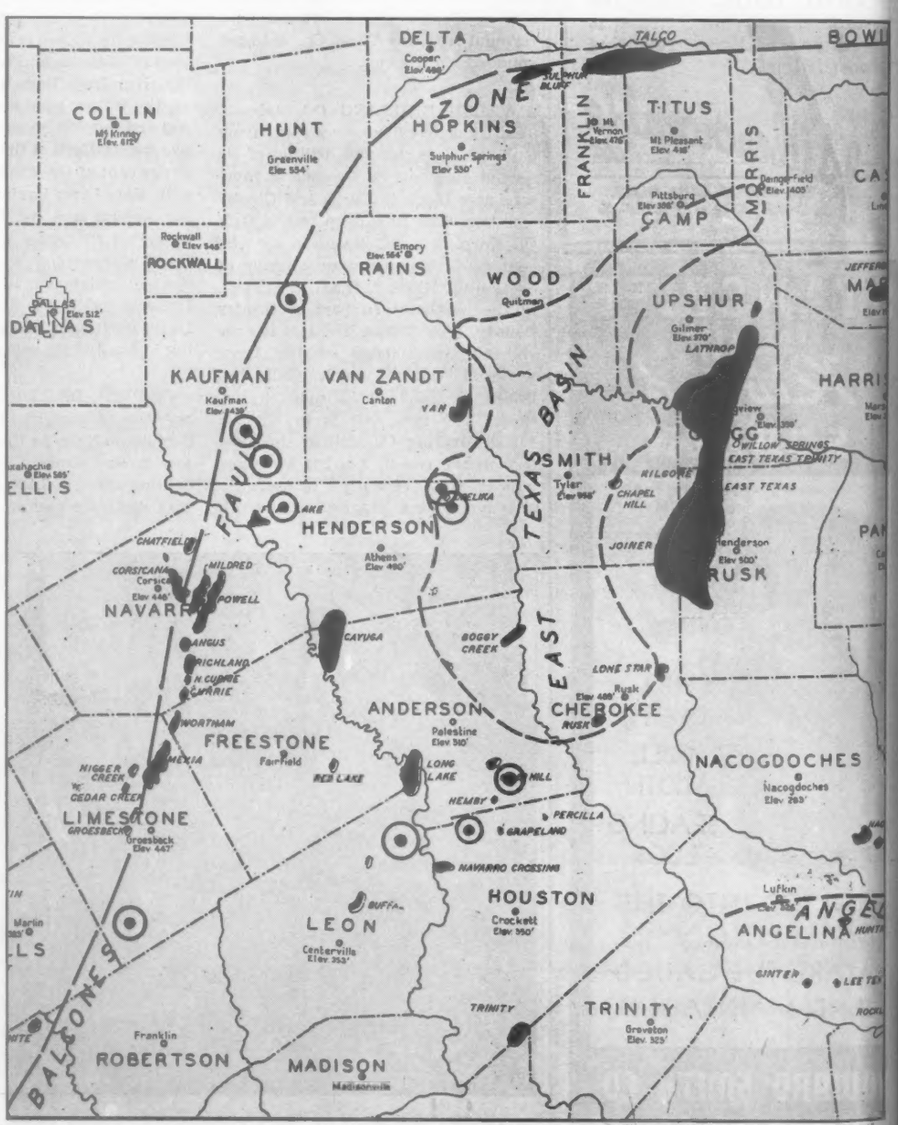
EASTERN TEXAS

DALLAS, Tex., Apr. 10.—Attention in lower eastern Texas was turned to the Leon County extension of the Navarro Crossing pool, where Humble Oil & Refining Co. was skidding rig from No. 1 Swift, extension well, to No. 1 W. O. Harris, T. C. Harris Survey, about 1,000 feet north of the new producer. Humble No. 1 E. F. Swift, in the H. W. Sublett Survey, Abstract 779, recorded an official gauge of 105 bbls. of 35.9-gravity oil in 24 hours with a gas-oil ratio of 13,780 to 1. The well is producing through perforations in the casing in the Woodbine sand from 5,841½ feet to 5,842½ feet. Humble is reported to have established field offices at Grapeland. The company is paying $1.10 per barrel for the Navarro Crossing crude with the completion of its pipe line into the area. The pool has 10 oil wells, two dry holes and two gas-distillate wells. Allowables at the present time are 75 bbls. per well daily on a six-day week. The company previously had charged 30 cents a barrel for trucking the oil to its Leon County station. The completion of the extension opens much acreage in the area for development.

Henderson County

Three miles north of the Flag Lake pool of northwestern Henderson County, Smith & Tyler and Richards & Holloway No. 1 Baker & Rowe, in the J. T. Childers Survey, which gave the northwestern part of the county a new Woodbine sand pool last week, was awaiting pumping equipment before taking an official gauge. Operators have erected two 1,000-bbl. tanks. According to the owners of the well, production is coming from 3,140 feet to 3,147 feet and the well has gauged, on initial tests, some 225 bbls. of fluid, 30 per cent of which was water.

(Continued on Page 96)



Zingery Oil Map Co., Fort Worth

East Central Texas' most important wildcats at the present time. Production has been opened in two areas by the increased wildcat campaign during the last two months

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Eastern Field Report

By STAFF CORRESPONDENT

Jackson County, W. Va., Has New Gas Field Near Lockhart

PITTSBURGH, Pa., Apr. 10.—A wildcat in Jackson County, West Virginia, appears to have opened up additional gas reserves in the deep sands. Located in Ravenswood district, Joe Rubin, Norwood P. Johnston, Jr., and others topped the Oriskany sand at 4,705 feet in the test on the D. P. Curry farm, and at 4,708 feet there was a showing of 278,000 cu. ft. of gas per day. It was then shut in and the rock pressure rose to 1,800 pounds in 12 hours and to 1,900 pounds at the end of 30 hours.

Drilling was resumed and little more gas was evidenced by the gauge. However, the sand as well as the cementing vehicle appeared porous and the bailer brought up fair-sized pieces of the sand so it was believed that the gas was freezing up at the sand as in the Columbiana County, Ohio, deep tests.

It was drilled to 4,721 feet, or only 16 feet in the sand and shot between 4,705½ feet and 4,721 feet with 30 quarts. Ten minutes after shot it gauged at the rate of 2,425,000 cu. ft. a day and was shut in for a later test. About 1½ bbls. of distillate a day appeared with the gas.

This well is on the Ripley Quadrangle about 2 miles west of Lockhart in Latitude 38 degrees, 58 minutes, 4 seconds, Longitude 81 degrees, 38 minutes, 45 seconds, and on Coon Run about 500 feet up from the end of the unimproved road. The surface elevation is 660 feet, the Corniferous lime top at 4,587 feet (steel line) and Oriskany at 4,705 feet or minus subsea 4,045 feet. It is located about 6 miles east of the test by Joe Rubin and others on the W. J. Brown farm, one-fourth mile up the Ohio River from Ravenswood, which gauged 400,000 cu. ft. a day after shot. The new test is higher on structure and was located after extensive seismograph work.

SOUTHEAST OHIO

The only new producer in Southeast Ohio was a test in Ashland County, by C. C. Cromer, trustee, on the Clyde Acker farm 1 mile north of Mohican Station in Section 15, Lake Township. It was completed in the Berea sand at 730 feet and produced 8 bbls. the first day, but after a shot it increased to 25 bbls.

In Cuyahoga County, Benedum & Trees completed a gas well on the F. E. Holada farm, Lot 24, Highland Heights, in the Newburg sand, total depth 2,840 feet. It gauged 6,000,000 cu. ft. a day.

In Muskingum County, W. L. Sutton completed a test on the John Payton and others lease in the southeast quarter Section 18, Harrison Township, through the Clinton sand and has a gas well in that formation. It gauged 100,000 cu. ft. a day. The well was drilled to the Medina and ran into water. It was plugged back to the Clinton and shot, after which it gauged 1,000,000 cu. ft. a day.

In Perry County, Gas Producing Co. of Ohio and others drilled a test on the Wilson heirs farm in the northeast quarter Section 6, Bearfield Township, through the Medina sand to 3,530 feet and it was dry.

In Washington County, Fred Bowman and others drilled No. 3 on the Rachel Wilson farm in the northeast quarter Section 10, Grandview Township, through the first Cow Run to 807 feet and it was dry.

SOUTHWEST PENNSYLVANIA

In Southwest Pennsylvania, Fayette County, Nollem Oil & Gas Co. has a small gas well on the Andy Manyak farm in Menallen Township. Big Injun sand was topped at 972 feet, with 33,000 cu. ft. a day showing as a first pay and a total gauge of 46,000 cu. ft. a day at bottom, 1,162 feet.

In Greene County, C. H. McVey and others completed the gas well on the Elmas Laughman farm at 3,220 feet with a final gauge of 53,000 cu. ft. a day from the fourth sand at 3,140-42 feet. It is located in Morris Township.

In Allegheny County, Shaler Township, J. S. Wally is drilling at 1,874 feet on the Wilson Shaw farm. Price Brothers have reached 1,325 feet on the J. L. Kirk farm. In Hampton Township, Oliver Miller was drilling at 180 feet on the William McNeal farm. In Fawn Township, C. C. Miller was drilling at 1,830 feet on the Delenbaugh farm. On Sewickley Heights, Charles B. Wachter is cleaning out an old well on the Mrs. Emma Skees farm, and is down 200 feet.

In Butler County, William Peiffer was drilling at 300 feet in No. 3 Behm on Breakneck Creek in Jackson Township.

In Amwell Township, Washington County, A. V. Lewis and others are drilling at 1,000 feet in No. 2 Sarah R. C. Dodd. In South Franklin Township, Foley & Williams are rigging No. 2 Ira Baldwin.

In North Franklin Township, Washington County, E. H. and J. B. Tague are building a rig for No. 15 William McKennan. In Morris Township, Manufacturers Light & Heat Co. is drilling at 930 feet on the R. W. Parkinson farm.

In Greene County, Equitable Gas Co. is rigging up No. 3 John Huffman in Washington Township; drilling at 2,525 feet, deepening No. 1 H. E. Chaney in Jackson Township; and drilling at 2,004 feet, deepening No. 1 I. J. Clutter in Center Township.

In Morris Township, Greene County, O. I. Dille and others has reached 2,750 feet in No. 2 Elisworth Beckham. In Franklin Township, J. B. Myers and others are down 2,840 feet on the Sallie (William) Morris farm. In Richhill Township, Burleigh Wright was at 1,712 feet, testing, in No. 1 Strawn Heirs and is down 3,445 feet, deepening No. 1 William McVay.

Deep Tests

The test of the New Penn Development Co., William E. Snee and others on the Indian Creek Coal & Coke lease on Chestnut Ridge in South Union Township, Fayette County, was drilled to 7,161 feet, steel line measurement, and there the formation is limy with some sand. The top of the Oriskany was 7,103 feet and it is now believed that there was some small additional gas at 7,109-28 feet. It will be shot with about 70 quarts in the Onondaga chert beds, from which the gas is coming between 6,963 and 6,985 feet. The total gauge is now 928,000 cu. ft. a day. These operators expect to deepen No. 1 Summit Hotel to the Oriskany as it is 100 feet short of that formation.

South along the ridge in Springhill Township, Fayette County, L. J. Houze Convex Glass Co. made some progress in a fishing job on the Paul Dunham farm in which the tools were lost at about 7,625 feet. After 25 feet it was necessary to recement.

In Armstrong County, the Peoples Natural Gas Co. is drilling at 3,290 feet on the Lowry Martin farm in Wayne Township.

WEST VIRGINIA

In Gilmer County, Pittsburgh & West Virginia Gas Co. completed No. 7665 on the A. L. Cottrill farm in Glenville district at 1,903 feet with the Big Injun sand at 1,847-1,903 feet and 33,624 cu. ft. of gas at 1,849 feet.

In Lincoln County, three old gas wells were deepened with added gas. In Duval district, Kanawha Gas & Utilities Co. deepened No. 2 Edward Davis to 3,808 feet, starting at 2,289 feet with the Brown shale at 3,405-3,798 feet and 328,000 cu. ft. of gas at 3,210, 3,405, 3,487 and 3,646 feet.

In Sheridan district, Lincoln County, Guyan Gas Co. deepened No. 2 J. W. Jeffers, starting at 1,608 feet with Berea 2,186-96 feet and 68,000 cu. ft. of gas from that sand two days after shot.

In Union district, Lincoln County, Woodall Gas Co. deepened No. 2 Ambrose Adkins, starting at 2,323 feet, with Brown shale at 3,396-3,716 feet and 68,000 cu. ft. a day 36 hours after shot at 3,400 and 3,425 feet.

In Monongalia County, J. I. Eddy & Co. deepened No. 1 D. R. Wright in Clay district through the Fifth sand to 3,094 feet with 133,000 cu. ft. of gas a day from the Gantz sand at 2,476 feet.

In Tyler County, Ohio Oil & Gas Co. on the Clyde Gorrell farm in Meade district drilled through the Injun sand to 2,305 feet and it was dry.

Oriskany Gas Field

In Jackson County, an extension of the Elk-Poca field in Kanawha County, Everett Starcher and others completed the test on the R. R. Boggess farm in Ripley district, an offset to his recent test on the Story Boggess farm which moved the northern limits of the field 2 miles north. The Corniferous lime was at 4,833 feet (steel line); Oriskany, 4,848 feet; gas, 4,951-61 feet. It was shot with 32 quarts after filling back to 4,990 feet and gauged 3,355,000 cu. ft. a day. The total depth was 4,994 feet.

In Poca district, Kanawha County, United Fuel Gas Co. is drilling in the Oriskany in the No. 4828 on the M. R. Mairs and others lease with that formation topped at 4,726 feet and 450,000 cu. ft. a day showing at 4,739 feet. At this depth, the bailer was dropped which is now being fished.

This company is drilling at 5,013 feet in No. 4825 W. P. Tolbert and others; at 2,700 feet in No. 4769 O. R. Schmittauer; at 2,820 feet in No. 4814 W. F. Beane; at 4,136 feet in No. 4826 Janey Gibson and others; at 4,975 feet in No. 4827 O. D. Price and others; at 1,750 feet in No. 4830 C. O. Slater and others; at 536 feet in No. 4831 B. C. Gillespie and others.

In this district, United Carbon Co. has reached 1,425 feet in the A. H. Campbell test, and 600 feet in tthe D. D. Slater and others test. West Virginia Gas Corp. is down 3,325 feet on the W. H. and T. S. Reese farm; Hayes Oil & Gas Co. at 100 feet in the J. A. Wilkinson test; Spartan Gas Co. spudding the Burdette-Haston test; Columbian Carbon Co. at 4,912 feet, with the Corniferous topped at 4,903 feet in the L. M. Fields and others test. In Elk district, this company topped the Corniferous at 4,861 feet on the M. N. Landers and others farm and will run casing. Poca Fork Oil & Gas Co. is drilling at 1,420 feet on its free.

In Union district, Ajax Gas Co. has reached 1,350 feet in the Clyde Anderson test and 400 feet in the Perry Marks test.

Deep Tests

In Ripley district, Jackson County, Everett Starcher and others are drilling at 1,900 feet on the Grady F. Boggess farm. In Washington district, United Carbon Co. started drilling No. 4 on the Elizabeth Ward Perkins farm.

In Ripley district, Jackson County, 6 miles southwest of the town of Ripley, the wildcat of the Columbian Carbon Co. on the G. W. Lathey farm is drilling at 3,932 feet. In Grant district, Pleasants County, Columbian's test on the Giles Hammat farm is straightening hole at 4,825 feet.

In Boone County, Owens Illinois Glass Co. is drilling in Corniferous lime in No. 13 Bull Creek Coal & Land Co. in Peytonia district. The depth is 4,750 feet.

New Work

The following locations have recently been made:

In Cabell County, J. W. Wilson on the W. H. Birch farm on Fudges Creek in Grant district, elevation 780 feet. In Lincoln County, Harmon Gas Co. on the Henry P. Lovejoy farm on New River in Jefferson

(Continued on Page 86)

Southwest Texas District

By F. L. SINGLETON

Major Extensions and Sand Discoveries Add to Reserve

CORPUS CHRISTI, Tex., Apr. 10.—The proven reserves of the Southwest Texas district were increased considerably the past week by major extensions and new sand discoveries. Important outposts were in the process of completion in the Benavides field in Duval County, and in the newly opened Mellon Creek field in Refugio County, while production was obtained from deeper sands in the South Clara Driscoll field in Nueces County and at the Kelsey field in Jim Hogg and Brooks counties.

A new oil field, 1½ miles southwest of the Alfred field, Jim Wells County, was apparently opened as Ike Howeth and others were running casing in No. 1 O. S. Adams after a 10-minute drill-stem test at 4,661-74 feet recovered 500 feet of 47-gravity oil and 93 pounds of pressure. Oil sand was cored at 4,667-74 feet, total depth. The well is in the William Adams Survey, about 9 miles northeast of the town of Alice.

A revival of drilling on the southwest side of the Benavides field, Duval County, was practically assured as a result of the showing of Henderson Coquart and others No. 1 Southland Life Insurance Co. which has cemented casing for a production test after a drill-stem test in the Pettus sand showed favorable indications. Casing was cemented on bottom at 5,298 feet, after a 30-minute drill-stem test at 5,275-98 feet tested 160 pounds of working pressure and 1,500 feet of pipe line oil. Sand with a gas odor was cored in the Government Wells sand at 4,535-44 feet and on a 12-minute drill-stem test at 4,535-48 feet the well tested 60 feet of oily mud and 180 feet of salt water. Another test in the Pettus sand at 5,275-92 feet tested 140 pounds of pressure and 350 feet of pipe-line oil. The well is located in Section 7 of the Ball Ranch subdivision in the Santos Flores grant, about 1½ miles southwest of the field proper, which produces from the Pettus sand at approximately the same depth.

Six Drilling on Pettus Trend

There are six active operations along the Pettus trend through the eastern half of the county and work was being started on four other wells. Lee Corkill and others have rigged up for No. 1 P. Benavides in Section 30, Sam Evan is moving in material for No. 1 W. R. Peters in the C.C.D. Co. Survey No. 66, while H. H. Howell has spudded No. 1 Atlee Parr in the San Andres grant, and Rutland Oil Co. is drilling below 212 feet in No. 1 Atlee Parr in the San Andres grant.

One mile due south of the discovery well of the Mellon Creek field, Refugio County, Quintana Petroleum Co. No. 3-B O'Connor cored sand showing oil at 5,858-70 feet and at 5,882-90 feet. The hole is bottomed in shale at 5,895 feet and casing is expected to be cemented for a production test after an electrical survey of the hole is made. This is the first well drilled south of the discovery well and in view of the fact that the discovery horizon was topped practically flat with the discovery well, it is possible that the main part of the structure may line in this direction. On the southwest side of the field and about 1,300 feet from production, Copano Oil Co. No. 4-C O'Connor is shut in after it flowed an unestimated amount of gas and high-gravity oil from perforated casing at 5,837-45 feet.

In the same county, several hundred feet north of the Tomoconnor field, Windsor Oil Co. No. 1 Power Heirs, cemented 5½-inch casing at 6,035 feet, and is being tested for the second time after it started flowing salt water through perforated casing at 5,938-41 feet. Before the salt water intrusion, the well was showing 90 per cent oil and 10 per cent wash water, flowing through a 9/64-inch choke under a tubing pressure of 600 pounds and casing pressure 300 pounds.

In the Bonnieview field, Refugio County, Royalty Oil & Gas Corp. and Rutherford Drilling Co. No. 1 Oppenheimer is being completed at about 4,200 feet as a gas well, but no details were available. The hole was drilled to 6,505 feet and 5½-inch casing was cemented at 4,301 feet. Several side-wall cores were taken and the only showing was at 4,241 feet which was logged as sandy shale with a good odor of oil. A drill-stem test of the section through perforated casing at 4,240-43 feet developed 200 feet of brackish water and 800 pounds of working pressure.

South Clara Driscoll Extended

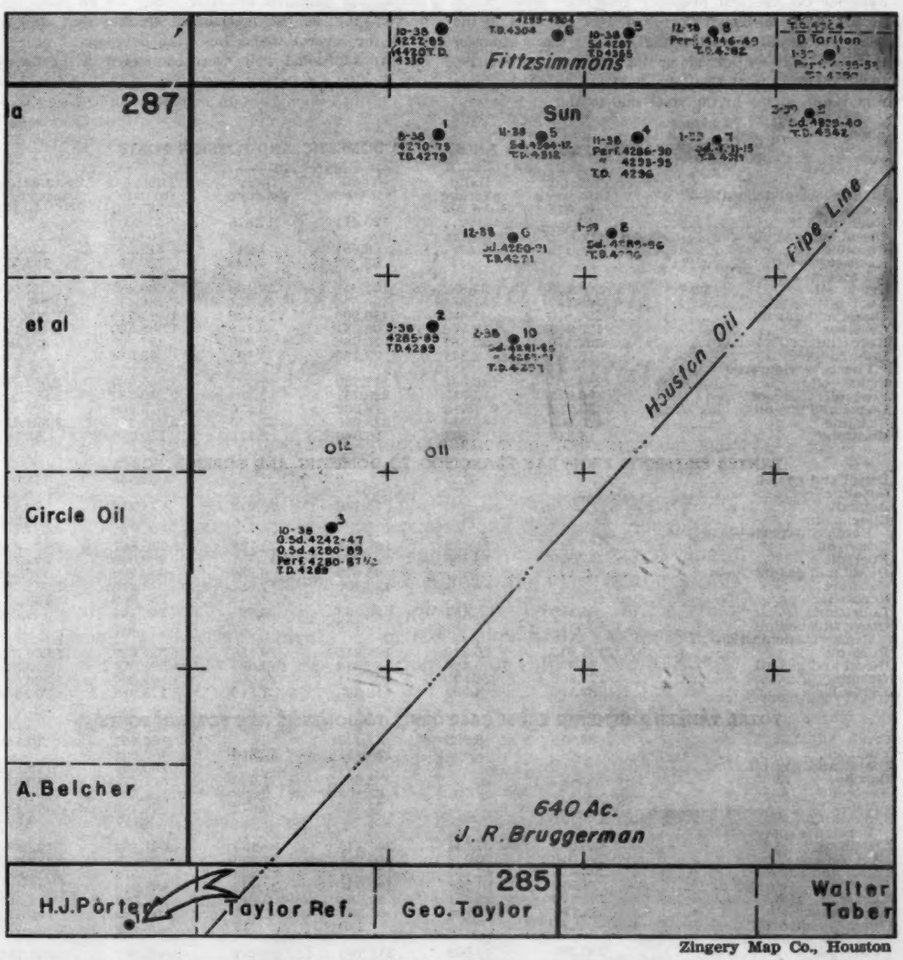
On the southwest side of the South Clara Driscoll field and about a half mile from production, Wellington Oil Corp. opened production from a deeper sand with the completion of No. 1 C. R. Richardson which was completed for an initial production of 147 bbls daily, flowing through a quarter-inch choke under a tubing pressure of 200 pounds and casing pressure 475 pounds. Gravity of the oil tested 37 degrees. The hole was drilled to a depth of 7,560 feet and the sand section shown by an electrical survey was at 6,558-70 feet. The well is in Section 111, J. Cabosos Survey. Main production in the field has been from the 5,300-foot horizon.

Wildcat operation along the active Jim Wells County sector of the Frio-Vicksburg trend continues to attract attention as two more wells were showing for possible pool openers. One mile southwest of Magnolia City in the A.B.&M. Survey, F. A. Gillespie and others No. 1 Shear was plugged back from a total depth of 6,590 feet to 5,470 feet, and 80 feet of 7-inch casing was cemented at 5,390 feet, preparatory to testing sand at 5,440-50 feet which showed favorable indications on an electrical survey. Locations for two more wildcats were made in the county the past week. Parr Drilling Co. is rigging up for No. 1 W. K. Hoffman, Section 8, LaVaca grant, while W. R. Quinn and others have derrick up for No. 1 D. M. and Fritz Pundt in the T. C. Wright Survey.

Production from a new sand was opened on the east side of the Kelsey field, Brooks County, with the completion of Humble Oil & Refining Co. No. 5 McGill Brothers which was completed for an initial production of 63 bbls. of 42-gravity oil daily flowing through a three-sixteenths inch choke under a tubing pressure of 850 pounds and casing pressure 1,200 pounds. The hole is bottomed at 6,402 feet, and the well was completed through perforated casing at 6,103-08 feet.

To the north and located 1 mlie west of production in the Sun field, Starr County, Sun Oil Co. was testing No. 1 George H. Speer in survey No. 238. Seven-inch casing was cemented on bottom at 5,188 feet and the

(Continued on Page 82)



Zingery Map Co., Houston

H. J. Porter No. 1 J. Mew which extended production of the Fitzsimmons field one-half a mile southwest

California Field Report

By
L. P. STOCKMAN

Southeast Coalinga May be Extended Four Miles North

LOS ANGELES, Calif., Apr. 10.—The most important development in California in the past week was the coring of 52 feet of saturated Gatchell oil sand in Amerada Petroleum Corp. No. 7-17 S.P.L., in Section 17-19-16, about 4 miles north of proved production in the Southeast Coalinga field of Fresno County. This outpost, elevation of 529 feet, cored productive horizon at 8,030-82 feet. Seven-inch casing was set. The bit was still in the pay when drilling operations were concluded, preparatory to landing the water string, and thus the exact amount of oil sand present remains to be determined. But 52 feet of Gatchell sand is capable of commercial production. It is believed that at least 150 feet of oil sand will be found in this well. Drilling operations will be resumed this week. The showing greatly stimulated interest in the area and would have led to extensive leasing if there was any acreage available in the vicinity.

Section 18-19-16 is now the hot spot in the district. Union Oil Co. holds a lease on the southeast quarter; Bandini Petroleum Co., a subsidiary of Wilshire Oil Co., the southwest quarter; Richfield Oil Corp. the northwest 160 acres, and Superior Oil Co. has a tentative lease on the northeast quarter. Bandini Petroleum Co. is expected to proceed with early work and Superior Oil Co. will probably also start early work.

Amerada Petroleum Corp. No. 7-17 S.P.L. is in the trend of the old shore line that follows the contour of the East Coalinga field along the east side of the structure. The Southeast Coalinga field is one of the most remarkable fields in the state due to the high saturation of the oil zone, the large amount of oil sand present and the exceptionally favorable porosity and permeability factors.

Large Structure

The Southeast Coalinga proven field is more than 1 mile wide and over 1 mile long and if Amerada Petroleum Corp. No. 7-17 S.P.L. is on the same structure its completion as an oil well will extend the length of the field to about 6 miles. Only the western limits of production have been determined by dry holes. Superior Oil Co. No. 1 Hight in Section 8-20-16 is the most easterly well, and the same company's No. 1 Cagle in Section 6-20-16 is the most northeasterly. Both were completed with large initials and No. 1 Cagle still has the record of having cored the greatest thickness of productive oil sand. No. 1 Cagle cored 590 feet of heavily saturated oil sand and was brought in flowing at the rate of 3,200 bbls. per day on a 75-minute test. Top of the oil sand was cored at 7,110 feet and base of the zone at 7,711 feet. The well could easily exceed 10,000 bbls. per day. It actually came in itself as it began flowing through a 14/64-inch bean as soon as the drilling mud had been displaced with water. The Texas Co. is drilling an east offset to No. 1 Cagle and should have No. 1 Exeter ready for an early production test as the mechanical trouble that delayed work for several weeks has been overcome.

Two additional wells were completed in the Southeast Coalinga field last week, No. 71-13-C of Standard Oil Co. in Section 13-20-15 and Superior Oil Co. No. 4 fee in Section 7-20-16. The former was brought in flowing 6,000 bbls. of 32.5-gravity oil and 3,620,000 cu. ft. of gas per day from 6,961 feet. This well, which has 190 feet of oil sand present, was brought in flowing through a 52/64-inch bean and showed a tubing pressure of 450 pounds and a casing pressure of 850 pounds. Top of the Gatchell zone was cored at 6,764 feet and base of the zone at 6,954 feet. Superior Oil Co. No. 4 fee was bottomed at 8,000 feet and brought in flowing 2,750 bbls. of 32.5-gravity oil and 1,900,000 cu. ft. of gas per day through a 32/64-inch bean. The hole was finished with a 9⅝-inch water string landed at 7,739 feet and 277 feet of liner including 257 feet of 100-mesh perforations.

Wilmington

In the Wilmington field of Los Angeles Basin V. R. G. Wilbur No. 3 Harbor was returned to production, pumping 75 bbls. of 14.4-gravity oil cutting 7 per cent from the Ranger zone with bottom of the hole at 3,724 feet. D. D. Dunlap No. 3-D Union Pacific proved to be a good producer when finished at 4,020 feet as it came in flowing 590 bbls. of 23.4-gravity oil through a 16/64-inch bean, from the Terminal zone, with the Ranger zone shut in. General Petroleum Corp. completed No. 2 Pacific Electric, flowing 943 bbls. of clean 25.3-gravity oil per day from 4,120 feet. The well was brought in flowing through a 40/64-inch bean and shows a tubing pressure of 340 pounds and a casing pressure of 700 pounds. In accordance with the curtailment program production was immediately reduced to 300 bbls. per day by reducing the bean to 16/64-inch.

Long Beach Oil Development Co. has staked location for 12 wells on property recently leased from the city of Long Beach but it will be two or three weeks before any work can get under way. The agreement between the operator and the municipality provides that a minimum of 12 strings of tools must be kept in operation and the 12 locations staked indicate the numbers of the first wells to be started. The lease comprises 269 acres of tideland acreage.

Due to compliance with an agreement among themselves, operators holding acreage in the Long Beach Harbor section of the Wilmington field are refraining from developing the Ford zone in that area. This agreement does not apply to leases east of the Ford area, as very little success has been experienced in developing production from the Ford zone on town lots.

Torrance

Only three wells were finished in the Torrance field of Los Angeles Basin. At 240th and Eshelman streets Symbol Oil Co. completed No. 3 Lomita flowing 290 bbls. of clean 27.4-gravity oil per day through a 15/64-inch bean from 5,165 feet and at 237th and Eshelman streets Whittier Santa Fe Springs Syndicate completed No. 1 Mertz flowing 260 bbls. of 26.6-gravity oil cutting 5 per cent from 5,166 feet. Symbol Oil Co. No. 3 Lomita was finished with a 7-inch water string landed at 4,800 feet while No. 1 Mertz of Whittier Santa Fe Springs Syndicate was finished with a 7-inch water string landed at 4,817 feet and 377 feet of 5½-inch liner including 349 feet of 120-mesh perforations and 5,104 feet of 2½-inch tubing with a packer at 4,722 feet.

In the Harbor City section of the Torrance field, General Petroleum Corp. completed No. 14 Poggi flowing 325 bbls. of 28.1-gravity oil cutting 4 per cent from 5,160 feet after landing a 7-inch water string at 5,095 feet. The center of interest in the Torrance field is the attempt of King Petroleum Co. and Riviera Petroleum Co. to develop commercial production near 247th and Walnut. If these wells result in commercial production an aggressive development program in the general area may be expected. Both No. 1 Extension

TANKER SHIPMENTS FROM LOS ANGELES TO DOMESTIC AND FOREIGN PORTS

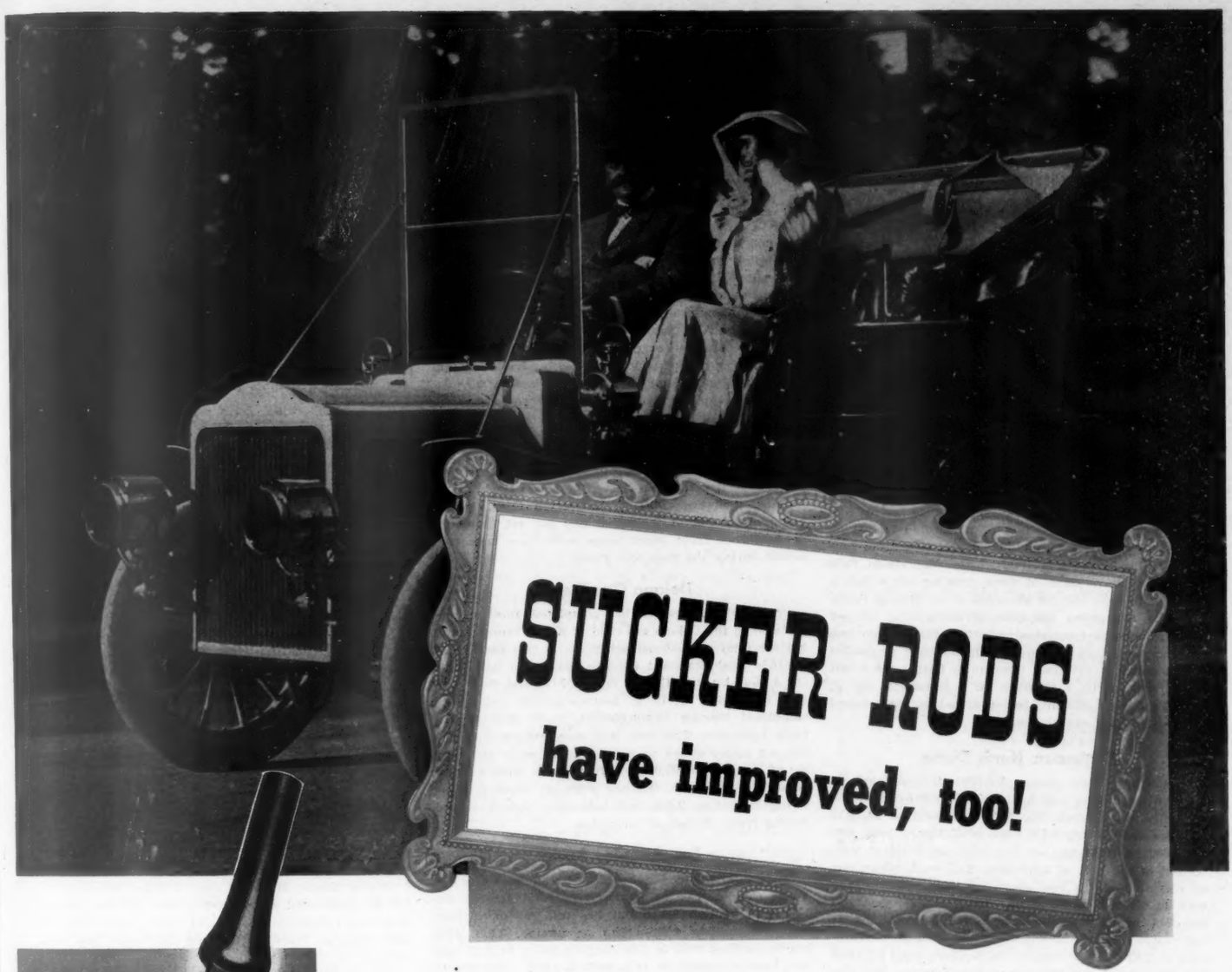
	April 1		March 25			
Intercoastal-domestic—	Total this week	Daily average	Total last week	Daily average	This year to date	Same time last year
Crude oil	62,318	8,903	.....	.....	185,791	70,180
Fuel oil	.....	.....	125,411	17,916	450,002	.....
Diesel and gas oil	.....	.....	.....	.....	163,501	.....
Gasoline	.....	.....	8,681	1,240	311,275	539,424
Kerosene	.....	.....	65,260	9,323	122,200	132,575
Foreign exports—						
Crude oil	391,173	55,882	101,051	14,436	3,745,437	6,087,936
Fuel oil	569,717	81,388	136,645	19,521	2,180,474	1,981,713
Diesel and gas oil	296,819	42,403	119,905	17,129	1,311,715	1,205,432
Gasoline	129,965	18,566	68,241	9,749	1,989,500	1,462,391
Kerosene	202,170	28,881	20,988	2,998	457,309	311,062
Lubricants	19,885	2,841	22,149	3,164	42,034	.....
Coastwise-domestic—						
Crude oil	280,265	40,038	212,780	30,397	2,655,887	3,051,785
Fuel oil	96,021	13,717	226,751	32,393	2,209,784	2,897,516
Diesel and gas oil	33,712	4,816	18,032	2,576	673,860	392,637
Gasoline	420,605	60,086	228,050	32,579	3,245,387	3,594,410
Kerosene	13,246	1,892	16,948	2,421	120,259	65,104

TANKER SHIPMENTS FROM SAN FRANCISCO TO DOMESTIC AND FOREIGN PORTS

Diesel and gas oil	.....	.....	.....	.....	69,550	178,662
Gasoline	.....	.....	.....	.....	.....	9,499
Asphalt	.....	.....	74,746	10,678	74,746	73,449
Lubricants	.....	.....	.....	.....	4,170	3,009
Foreign exports—						
Crude oil	78,112	11,159	166,097	23,728	1,295,667	1,065,484
Fuel oil	127,329	18,190	124,296	17,757	659,005	500,757
Diesel and gas oil	.....	.....	43,672	6,239	359,799	430,248
Gasoline	.....	.....	123,790	17,684	893,813	1,231,585
Kerosene	.....	.....	.....	.....	262,209	133,327
Lubricants	36,853	5,265	38,155	5,451	163,196	145,340
Other finished oil	.....	.....	120	17	120	.....
Coastwise-domestic—						
Fuel oil	141,612	20,230	188,215	26,888	1,534,037	1,606,629
Diesel and gas oil	38,429	5,490	40,614	5,802	201,917	422,388
Gasoline	171,506	24,501	202,311	28,902	1,309,387	1,596,932
Kerosene	32,196	4,599	12,692	1,813	173,289	205,444

TOTAL TANKER SHIPMENTS FROM CALIFORNIA TO DOMESTIC AND FOREIGN PORTS

Crude oil	62,318	8,903	.....	.....	185,791	70,180
Fuel oil	.....	.....	125,411	17,916	450,002	.....
Diesel and gas oil	.....	.....	.....	.....	233,051	178,662
Gasoline	.....	.....	8,681	1,240	311,275	548,923
Kerosene	.....	.....	65,260	9,323	122,200	132,575
Asphalt	.....	.....	74,746	10,678	74,746	73,449
Lubricants	.....	.....	.....	.....	4,170	3,009
Foreign exports—						
Crude oil	469,285	67,041	267,148	38,164	5,041,104	7,153,420
Fuel oil	697,046	99,578	260,941	37,279	2,839,479	2,482,470
Diesel and gas oil	296,819	42,403	163,577	23,368	1,671,514	1,635,680
Gasoline	129,965	18,566	192,031	27,433	2,883,313	2,693,976
Kerosene	202,170	28,881	20,988	2,998	719,518	444,389
Lubricants	56,738	8,105	60,304	8,615	205,230	145,340
Other finished oil	.....	.....	120	17	120	.....
Coastwise-domestic—						
Crude oil	280,265	40,038	212,780	30,397	2,655,887	3,051,785
Fuel oil	237,633	33,948	414,966	59,281	3,743,821	4,504,145
Diesel and gas oil	72,141	10,306	58,646	8,378	875,777	815,025
Gasoline	592,111	84,587	430,361	61,480	4,554,774	5,191,342
Kerosene	45,442	6,492	29,640	4,234	293,548	270,548



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OIL WELL SUPPLY COMPANY

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of King Petroleum Co. and Riviera Petroleum Co. No. 1 Bass and Goodnight are nearing the pay and thus the outcome of this extension work may be determined within a few days.

Rosecrans

In the Rosecrans field of Los Angeles Basin no gauge was available on Union Oil Co. No. 31 Rosecrans, finished at 7,718 feet, and it may be several days before it shows a steady flow. This well does not seem to have much kick although it flows by heads for several hours at the rate of 250 bbls. per day. Metcalfe Oil Co. No. 1 Bradford was brought in flowing 880 bbls. of 30.7-gravity oil per day through a 34/64-inch bean from the O'Dea zone at 7,702 feet. Top of the O'Dea zone was logged at 7,380 feet indicating 322 feet of productive zone. Drilling operations have tapered off in this field and there are only four strings of tools in operation.

Montebello

Standard Oil Co. completed the only well finished in the western extension of the Montebello field of Los Angeles Basin. No. 2 Harvey was returned to production flowing 645 bbls. of 37.8-gravity oil per day from the seventh zone with bottom of the hole at 7,200 feet. It was finished with 1,530 feet of 6⅝-inch blank liner cemented at 6,890 feet and 343 feet of 5½-inch liner including 301 feet of perforated landed on bottom at 7,200 feet. Standard Oil Co. is drilling four other wells in the west end of the Montebello field and should have some of them tanking oil within a week or 10 days. No. 30 Monterey of St. Helens Petroleum Co. is flowing 250 bbls. of 32.3-gravity oil per day through the formation tester but the perforations may be sanded up, as the well should have responded with a much larger flow. Graham & Loftus got a salt water well in No. 1 Coffman on a formation test at 6,910-7,010 feet, and are coring ahead for the second member of the seventh zone.

Kettleman North Dome

Kettleman North Dome Association completed an excellent producing well in the Kettleman North Dome field this week when No. 78-22-Q in Section 22-22-18 was finished flowing 1,791 bbls. of 35.1-gravity oil and 1,900,000 cu. ft. of gas per day from the Temblor with bottom of the hole at 7,960 feet. This well, which has an elevation of 797 feet above sea level, was finished with an 8⅝-inch water string landed at 7,289 feet and 690 feet of 6⅝-inch liner including perforations at 7,242-7,956 feet which was cemented through perforations at 7,826 feet. It topped the McClure shale at 5,645 feet and picked up the top of the Temblor at 7,026 feet and was brought in flowing through a 1½-inch bean. Kenda has completed drilling on No. 36-18-Q in Section 18-22-18 at 7,739 feet after landing a 7-inch water string at 7,159 feet and 609 feet of 5¾-inch liner and should have it ready for a production test within a few days. Standard Oil Co. No. 76-7-Q in Section 7-22-18, has been finished mechanically with a 9⅝-inch water string at 7,015 feet and 1,315 feet of 6⅝-inch liner which was gun perforated after being placed in the hole. Several new wells are being started by both Kettleman North Dome Association and Standard Oil Co. with a decided tendency to move eastward where both have considerable undrilled acreage.

Rio Bravo

General Petroleum Corp. in the Rio Bravo field of Kern County completed No. 1 Caldwell in Section 35-28-25, flowing 1,650 bbls. of clean 36.6-gravity oil and 1,016,000 cu. ft. of gas per day from the Rio Bravo zone with bottom of the hole at 11,530 feet. It was finished with a 6⅝-inch water string landed at 11,384 feet and was brought in flowing through a 27/64-inch bean behind which the well showed a tubing pressure of 1,500 pounds and a casing pressure of 1,800 pounds. Production was pinched back to 305 bbls. per day immediately after completion. No. 2 Van Ness of General Petroleum Corp. in Section 2-29-25 is still held up with a fishing job due to a twist-off of drill pipe when the well was down 5,476 feet. Superior Oil Co. is setting a new record for fast drilling in No. 1 Moodie as in less than nine days the company has made 6,710 feet of hole. This well is being drilled with a 165-foot derrick and extra large engine. Only three wells are under way in the Rio Bravo field due to the decision of operators to reduce drilling operations to a minimum. Union has just spudded in No. 8-34 Kern County Land in Section 34-28-25, a south offset to Superior Oil Co. No. 1 Moodie. In General Petroleum Corp. No. 1 Caldwell, mentioned above, top of the upper Rio Bravo zone was logged at 11,124 feet and the well is producing from both the upper and lower Rio Bravo zones.

Coastal Area

In the Santa Maria Valley field of Santa Barbara County, Gerard & Thompson have completed No. 1 Berneiser in Section 27-10-34 flowing at the rate of 2,750 bbls. of clean 16.2-gravity oil per day from 4,970 feet. Chansior Canfield Midway Oil Co. has concluded drilling operations on No. 25-B Hobson in the Rincon field of Ventura County at 4,658 feet by landing an 8⅝-inch water string at 4,000 feet and 646 feet of perforated liner including 640 feet of perforated and is swabbing for production. Rincon Oil Co., which is drilling on a steel "island" in the Pacific Ocean outside the upland section of the Rincon field, is down 2,078 feet, in oil sand, and is preparing to run in casing preparatory to an early production test. In the Sespe district of Ventura County, H. A. Ivers has completed work on No. 14 Kentuck after landing 290 feet of 6⅝-inch liner including 289 feet of perforated and should make a production test within a few days. In the Ventura Avenue field, Lloyd Corp. is drilling ahead in oil sand and shale at 9,640 feet and may be able to complete a commercial producer in this project, located in the extreme eastern end of the Ventura Avenue structure. Alliance Petroleum Corp. is also going ahead but at 7,770 feet has not yet found the deep 57 zone from which large wells have been completed during the past few years.

Delano Gas Field

Trico Oil & Gas Co. has completed another good gas well in the Delano gas field of Kern County, bringing the total commercial producers in this field to 10. Of this total Standard Oil Co. has seven and Trico Oil & Gas Co. has three. Trico Oil & Gas Co.'s new well was No. 1 T. G. in Section 2-25-23 and it was completed flowing 15,000,000 cu. ft. of gas per day from 2,434 feet. This new well was brought into production under wraps as it later indicated it was capable of flowing 25,000,000 cu. ft. per day with a larger bean. The hole was finished with an 8⅝-inch water string landed at 2,405 feet indicating that it is producing from 29 feet of formation.

Los Angeles Basin

In the Anaheim district of Los Angeles Basin the Texas Co. has reached a depth of 8,841 feet in No. 13-1-A in Section 8-4-10 but has not yet found anything resembling commercial production. This wildcat is the first well in Los Angeles Basin to drill into the Eocene, which in this well is tight with practically no permeability. Very little Miocene was logged.

In the Sunset Beach area, No. 1 Graham of Patos Drilling Co. in Section 21-5-11 showed a small amount of oil sand at 5,944-64 feet thus encouraging the operators.

West of the Montebello field, Ridge Oil Co. has reached 4,578 feet and has been spot-coring for the past few hundred feet. This wildcat is more than a mile west of production. In No. 1 Nieto, Union Oil Co. is nearing the 4,000-foot level and will probably start coring within the next few hundred feet. This well has considerable merit but has no connection with the old Seal Beach field which is located in close proximity. No. 1 Nieto is located in Section 12-5-12 in Orange County. In the Yorba Linda district of Los Angeles Basin, Shell Oil Co. has initiated some new drilling on the Stern lease in Section 23-3-9 which is some distance from production. Shell's last discovery in Southern California was on the Olinda Land Co. where a shallow well was finished flowing 2,500 bbls. per day. Shell Oil Co. purchased this acreage in fee after coring the pay and therefore is not obliged to proceed with any further drilling until it chooses to do so.

Southwest Texas Fields

(Continued from Page 79)

well is being tested through perforated casing at 4,966-72 feet. A previous test at 5,099-5,118 feet showed salt water.

In the same county and located about 1½ miles northeast of the Barbacoas field, Magnolia Petroleum Co. No. 1 M. M. Garcia is being watched with much interest after the well attempted to blow out at a total depth of 6,104 feet. The drill stem became stuck and the progress of the well has been temporarily suspended. Shale and sand having a slight oil odor were cored at 5,511-35 feet, and sand with a gas odor at 5,627-28 feet. Sandy shale and sand with a slight odor of oil were cored at 5,738-41 feet, and the well attempted to blow out after drilling from 6,084 to 6,104 feet.

In the Slick field, Dewitt County, Whitex Oil Co. No. 1 W. L. C. Poetter, Marshall Survey, is running casing for a production test after a drill-stem test at 4,150-4,210 feet tested 50 pounds of pressure and 140 feet of oily mud. Bottom of the hole is 4,437 feet.

SOUTHWEST TEXAS COMPLETIONS IN PROVEN FIELDS

Aransas-San Patricio Counties

McCampbell field: Brauer and others No. 3 Brauer, perforated casing 7,124-27 feet, 136 bbls., three-sixteenths inch choke. Corgey & Grote No. 1 Conn Brown, 7,160 feet, 175 bbls., three-sixteenths inch choke. Corgey & Grote No. 5 McCampbell, 7,160 feet, 160 bbls., three-sixteenths inch choke. Mortex Oil Corp. No. 2 Kuchs, perforated casing 7,149-53 feet, 156 bbls., three-sixteenths inch choke. H. Wegner No. 1 R. E. Farley, 7,160 feet, 165 bbls., jetting.

Bastrop County

Riddle field: Ogden & Riddle No. 2 Riddle, 1,733 feet, abandoned. Ogden & Riddle No. 4 Riddle, 1,764 feet, abandoned. Eckert field: O. H. Hierholzer, Jr., No. 1 Gembler, 970 feet, abandoned. Somerset field: W. M. Allison No. 2 Miller and others, 1,400 feet, pumping. Von Ormy field: Roger Putnam No. 15 Wetz, 698 feet, 4 bbls., pumping.

Caldwell County

Luling field: Rio Bravo Oil Co. No. 6 Moore, 2,145 feet, 75 bbls. oil, 125 bbls. water, pumping.

Calhoun-Victoria Counties

Heyser field: Gulf Oil Corp. No. 7 Bonner, 5,450 feet, gas well. Gulf Oil Corp. No. 14-B Traylor, sand 5,484-92 feet, 39 bbls., 3/32-inch choke.

Duval County

Benavides field: Hiawatha Oil & Gas Co. No. 24 Parr, sand 4,724-33 feet, 96 bbls., 5/32-inch choke. Saltmount Oil Corp. No. 4-B Puig, 4,807 feet, 63 bbls. in 12 hours, three-sixteenths inch choke. Cedro Hill field: Magnolia Petroleum Co. No. 4 Duval County Ranch Co., 1,454 feet, 90 bbls. in 16 hours, pumping. Fitzsimmons field: H. J. Porter No. 1 Mew, sand 4,279-85½ feet, 136 bbls., 7/64-inch choke. Hoffman field: Cuellar Brothers No. 1-B fee, perforated casing 2,669-75 feet, 50 bbls., jetting. Magnolia Petroleum Co. No. 31 Weil, 2,828 feet, 145 bbls., jetting. Piedra DeLumbre, 2,047 feet, 200 bbls., jetting.

Live Oak County

Oakville field: Simmons Oil Co. No. 7-B McGriff, perforated casing 2,824-28 feet, 50 bbls., quarter-inch choke.

McMullen County

Ezzell field: Harry Ezzell No. 33 fee, perforated casing 1,462-65 feet, 159 bbls., pumping. Harry Ezzell No. 34 fee, perforated casing 1,470-75 feet, 183 bbls., pumping.

Nueces County

Clara Driscoll field: R. B. Bryant No. 1 J. Galvin, sand 5,612-80 feet, 144 bbls., eighth-inch choke.

Refugio County

Mellon Creek field: Copano Oil Co. No. 5-C O'Connor, sand 5,839-51 feet, 113 bbls. in 12 hours, 5/32-inch choke.

San Patricio County

East White Point field: Nueces Royalty Co. No. 1 Green, perforated casing 5,622-28 feet, 135 bbls., eighth-inch choke. Plymouth Oil Co. No. 1 Solar-Ficke, perforated casing 5,628-31½ feet, 128 bbls., 7/64-inch choke. Shell Petroleum Corp. No. 5 Kirk, sand 5,613-64 feet, 138 bbls., eighth-inch choke.

Starr County

Sun field: Sun Oil Co. No. 3 Olivarez, perforated casing 4,658-88 feet, 115 bbls., eighth-inch choke.

Webb County

Killam field: O'Hern and Ryan No. 3 Garcia, sand 1,986-89½ feet, 40 bbls., pumping.

Zapata County

Mirando Valley field: Buffalo Oil Co. No. 4-C Hinnant, sand 1,951-63 feet, 136 bbls., jetting. Carter & Rubsamen No. 1 Lopez, 2,228 feet, abandoned.

Increased Outlet for Lance Creek Crude; More Drilling

By T. R. INGRAM

DENVER, Colo., Apr. 10.—A new producing area in Eddy County, New Mexico, has been opened at Harvey E. Yates No. 1 Travis, NE SE SE Section 6-18-29e, about midway between the new Loco Hills area and the Artesia field. It was shot with 450 quarts at 2,490-2,580 feet and then tanked 40 bbls. of oil in 14 hours. The crew was testing and cleaning out. It found oil sand series beginning at 2,492 feet and was bottomed at 2,606 feet. Gas sand was found at 2,470-80 feet.

Barnett Oil Development Co. No. 1 King, C NW SE Section 23-26-30, Delaware sand wildcat test in southeastern Eddy County, was abandoned at 4,051 feet, total depth, with 1,200 feet of sulfur water in the hole. Delaware sand was found at 3,655 feet.

The following wells in Lea County were completed:

Phillips Petroleum Co. No. 28 Santa Fe, C NE SW Section 23-17-35, Vacuum field, topped pay at 4,127 feet, total depth 4,633 feet, was acidized and flowed 377 bbls. of oil in 11 hours with 416,000 cu. ft. of gas.

Shell Petroleum Corp. No. 1-C State, C NE SE Section 24-17-34, pumped 97 bbls. of oil daily through 2-inch tubing set at 4,666 feet. Pay was found at 4,630 feet, total depth 4,733 feet.

Phillips Petroleum Co. and Pure Oil Co. No. 6 Woolworth, C NE NE Section 33-24-37, topped pay at 3,421 feet, total depth 3,541 feet, set tubing at 3,508 feet and flowed 331 bbls. of oil in five hours. Gas gauged 1,625,000 cu. ft. daily. It is in the Jal district.

Culbertson & Irwin No. 3 Henry, SW SW SW Section 26-25-37, flowed 70 bbls. of oil in 24 hours, cutting 7 per cent water, through tubing set at 3,723 feet. Pay was found at 3,214 feet and the well was bottomed at 3,325 feet.

Stanolind Oil & Gas Co. No. 4-A Hill, C SW NE Section 6-21-37, East Eunice area, topped pay at 3,665 feet, total depth 3,770 feet and flowed 10 bbls. of oil an hour. Gas was estimated at 250,000 cu. ft. daily.

F. C. Wilson No. 3 State, NW SE NE Section 7-21-35, found sulfur water at 3,881-83 feet, total depth, and was abandoned.

Lea County

Fred Turner, Jr., No. 1 Lea Co. State Bank, C SW SW Sec. 30-14-38 (wildcat). Drlg. 3,900 ft.

Carper-Taylor No. 1 Taylor (wildcat), SW SW SW Sec. 30-16-32. Drlg. 3,917 ft.

Magnolia Pet. Co. No. 1-Q State, C SW NE Sec. 36-16-36. R.U.R.

Repollo Oil Co. No. 2 State, Lse. 182, C S½ NE SW Sec. 31-16-37. Drlg. 2,500 ft.

Carper Drlg. No. 1 Simon, C NE NE Sec. 29-17-32. Drlg. 1,115 ft.

Cities Service No. 2-K State, C SE NE Sec. 27-17-35. W.O.C. 1,664 ft.

Continental Oil Co. No. 1-A Sanderson B-14, C N½ NW NW Sec. 14-20-36. W.O.C. 1,443 ft.

Continental Oil Co. No. 6 State H-35, C NE NW Sec. 35-17-34. C.&P.

Drlg. & Exploration No. 1-M State, C SW SE Sec. 29-17-35. Drlg. 1,296 ft.

Drlg. & Exploration No. 1-W State, NW NW SE Sec. 26-17-35. Drlg. 1,482 ft.

Humble O. & R. Co. No. 2-K State, C NW NE Sec. 32-17-35. T.D. 4,675 ft.; tstg.

Humble O. & R. Co. No. 4-K State, C NE SE Sec. 32-17-35. Drlg. 3,670 ft.

Magnolia Pet. Co. No. 2-P State, C SE SE Sec. 22-17-35. Drlg. 3,640 ft.

Magnolia Pet. Co. No. 1-R State, C NW SE Sec. 1-17-36. Loc.

Magnolia Pet. Co. No. 1 Selby, C NW NE Se. 7-17-37. R.U.R.

Magnolia Pet. Co. No. 27 State-Bridges, C SE NE Sec. 26-17-34. 1,000 ft. O.I.H.; drlg. 4,652 ft.

Magnolia Pet. Co. No. 28 State-Bridges, C NW NW Sec. 26-17-34. Drlg. 3,925 ft.

Magnolia Pet. Co. No. 29 State-Bridges, C SW SW Sec. 26-17-34. Drlg. 4,214 ft.

Magnolia Pet. Co. No. 30 State-Bridges, C SW NE Sec. 26-17-34. Drlg. 2,110 ft.

Magnolia Pet. Co. No. 31 State-Bridges, C NE NW Sec. 23-17-34. C.&P.

Maljamar O. & G. Co. No. 2-B Baish, C NE NE Sec. 27-17-32. T.D. 2,602 ft.; S.D.O.

Maljamar O. & G. Co. No. 2 Mitchell, SW SE SW Sec. 5-17-32. W.O.C. 990 ft.

Ohio Oil Co. No. 1 State-Warn, C SE NE Sec. 33-17-35. Drlg. 3,910 ft.

Phillips Pet. Co. No. 4 Hale, C SE SW Sec. 35-17-34. Loc.

Phillips Pet. Co. No. 5 Hale, C NW SE Sec. 35-17-34. Loc.

Phillips Pet. Co. No. 12 Santa Fe, C NE SW Sec. 28-17-35. T.D. 4,700 ft.; swb. 21 B.O. in 7 hrs.

Phillips Pet. Co. No. 15 Santa Fe, C NE NE Sec. 28-17-35. T.D. 4,700 ft.; C.O. 4,670 ft. and acd.

Phillips Pet. Co. No. 27 Santa Fe, C SW NE Sec. 34-17-35. Drlg. 3,105 ft.

Phillips Pet. Co. No. 29 Santa Fe, C SW NW Sec. 33-17-35. Loc.

Shell Oil Co. No. 1-V State, C NE NE SE Sec. 21-17-35. Rng. tbg. 4,680 ft.

Shell Oil Co. No. 2-N State, C SE NE Sec. 28-17-35. Drlg. 635 ft.

Standard Oil Co. of Texas No. 2 State, Lse. 6, C NE SW Sec. 34-17-35. T.D. 4,649 ft.; P.B. 4,602 ft.; est. 10 B.O.P.H.

Texas Co. No. 3-N State, C SW NW Sec. 30-17-35. Drlg. 800 ft.

Texas Co. No. 2-S State, C SW SW Sec. 35-17-34. Drlg. 3,825 ft.

Texas Co. No. 1-T State, C SE NE Sec. 25-17-34. T.D 4,725 ft.; pump 5 B.O. and pump off; to C.O.

Texas Co. No. 2-T State, C SW SE Sec. 34-17-34. Drlg. 3,254 ft.

Twin Oil Corp. No. 1-D State, C SW NE Sec. 30-17-35. T.D. 4,700 ft.; tstg.

United Producers No. 1 Caylor, NE NE NW Sec. 6-17-37. Loc.

Fullerton Oil Co. No. 1-A Walker, C SW NW Sec. 18-18-32. T.D. 4,225 ft.; S.D.O.

Phillips Pet. Co. No. 16 Santa Fe, C NW SW Sec. 5-18-35. T.D. 5,030 ft.; S.D.O.

Texas Co. No. 1-X State, C NE NE Sec. 3-18-34. Drlg. 3,535 ft.

P. B. English No. 1 Miller, C NE SE Sec. 18-19-32 (wildcat). T.D. 3,077 ft.; W.O. csg.

Great Western Prod. Co. No. 2 Bordages, NE SE NW Sec. 33-19-37. T.D. 3,931 ft.; P. 115 B.O.P.D.

Continental Oil Co. No. 5 Britt B-15, SL NW NE SW Sec. 15-20-37. Drlg. 3,127 ft.

Stanolind O. & G. Co. No. 4-B Gilluby, NW NW NW Sec. 22-20-37. Drlg. 1,820 ft.

Texas Co. No. 17 Lieu-Lands, NW NW SW Sec. 19-20-37. W.O.C. 3,680 ft.

Aloco Oil Co. No. 1 Carson, C SW SE Sec. 28-21-37. Drlg. 3,765 ft.

Bryant-Drillexco No. 3 State, C S½ NW SE Sec. 12-21-35. Drlg. 3,210 ft.

Danglade & Clower No. 1 Corrigan, C NE SE Sec. 33-21-37. Drlg. 3,234 ft.

Danglade & Clower No. 1 Owen, NW SW SW Sec. 34-21-37. Drlg. 3,750 ft.

Gulf Oil Corp. No. 1-C Carson, C NE NE Sec. 33-21-37. Drlg. 2,435 ft.

Gulf Oil Corp. No. 1-C Leonard, C SE SW Sec. 36-21-36. W.O.C. 3,705 ft.

Gulf Oil Corp. No. 2-B Mattern, C SE NE Sec. 31-21-37. T.D. 3,800 ft.; shot and C.O.

John G. Menke No. 2 Alexander, C NE NW Sec. 5-21-37. Drlg. 3,640 ft.

J. C. Clower No. 1 Christmas, SE SE SW Sec. 28-22-37. Spdg.

Continental Oil Co. No. 6 State J-2, C SW SE Sec. 2-22-36. W.O.C. 285 ft.

Continental Oil Co. No 5 State J-2, C SE SE Sec. 2-22-36. Drlg. 2,600 ft.

Gulf Oil Corp. No. 4-E Mattern, C SW SW Sec. 1-22-36. Drk.

Olean Pet. Co. No. 2 Farrell, SW SE SE Sec. 22-22-37. T.D. 3,757 ft.; P.B. 3,655 ft.; acd. 3,635 ft.

Lem Peters No. 2 Call, C W half NW SW Sec. 26-22-37. C.&P.

Repollo Oil Co. No. 1-D State, Lse. 157, NW NW SW Sec. 12-22-36. Drlg. 1,050 ft.

Shell Pet. Corp. No. 1 T. O. May, NW NW NW Sec. 35-22-37. Spdg.

Skelly Oil Co. No. 2-A Baker, SW SW NW Sec. 26-22-37. C.&P.

Skelly Oil Co. No. 7 Baker, C NW NE Sec. 27-22-37. T.D. 3,655 ft.; F. 96 B.O.P.D.

Skelly Oil Co. No. 8 Baker, SW NE NE Sec. 27-22-37. C.&P.

Skelly Oil Co. No. 5 Simms, C SW SE Sec. 33-22-37. T.D. 3,705 ft.; 2,000 ft. O.I.H. in 24 hrs.

Texas Co. No. 2-B Fally, C SE SW Sec. 8-22-37. T.D. 3,720 ft.; P.B. 3,707 ft.; F. 20 B.F.P.D., 23 per cent B.S.

Texas Pacific C. & O. No. 15-A State, C N½ SE NW Sec. 11-22-36. T.D. 3,418 ft.; fsg. D.P.

Continental Oil Co. No. 1 Lynn A-28, C SW NE Sec. 28-23-36. R.U.R.

Walter Donnelly No. 1 Davis, C SE NW Sec. 33-23-37. T.D. 3,600 ft.; tstg.

Great Western Prod. No. 2-B Leonard, C NW NW Sec. 32-23-37. Drlg. 3,105 ft

Anderson & Prichard No. 1-A State, C SW NW Sec. 32-24-37. C.&P.

Humble O. & R. No. 1-L State, C NE SE Sec. 32-24-37. W.O.C. 432 ft.

Humble O. & R. No. 4 Williams, C NW NW Sec. 34-24-37. T.D. 3,530 ft.; F. est. 20 B.O. in 2 hrs.

Kan-Mex Oil Co. No. 3 Vaughn, C SW NW Sec. 3-24-36. Drlg. 1,370 ft.

North Shore Oil Corp. No. 3 Woolworth, SW SW NW Sec. 33-24-37. Drlg. 3,494 ft.

North Shore Oil Corp. No. 4 Woolworth, NW NW NW Sec. 33-24-37. Loc.

Parker Drlg. Co. No. 3 Erwin, C W½ NE SW Sec. 35-24-37. T.D. 3,460 ft.; F. 10 B.O. in 8 hrs.; est. 3,000,000 cu. ft. gas.

Phillips and Pure No. 5 Woolworth, C SW SE Sec. 33-24-37. W.O.C. 3,356 ft.

Phillips & Pure No. 7 Woolworth, C SW NE Sec. 33-24-37. Loc.

Repollo Oil Co. No. 2-C State Lse. 157, NE SE SE Sec. 32-24-37. Drlg. 1,119 ft.

Schermerhorn Oil Co. No. 5 Woolworth, NW SW NE Sec. 28-24-37. T.D. 3,537 ft.; F. est. 30 B.O.P.D.

Schermerhorn Oil Co. No. 6 Woolworth, C SW SE Sec. 28-24-37. Drlg. 3,137 ft.

Shasta Oil Co. No. 1 Woolworth, NE NE NW Sec. 28-24-37. T.D. 3,601 ft.; tstg.

Weir Drlg. Co. No. 3 Woolworth, NE SW SW Sec. 28-24-37. T.D. 3,272 ft.; S.G. 3,247 ft.

Anderson & Prichard No. 5 Wells, C NW NE Sec. 5-25-37. T.D. 3,552 ft.; F. 112 B.O. in 16 hrs.

Anderson & Prichard No. 1 Woolworth, NW NE NE Sec. 17-25-37. Drlg. 3,374 ft.

Italo Pet. Corp. No. 1 Carlson, SW NE NW Sec. 26-25-37. Drlg. 1,885 ft.

Italo Pet. Corp. No. 3 Carlson B-27, NE SE SE Sec. 27-25-37. Loc.

Phillips and Pure No. 2 Woolworth, C SE NE Sec. 6-25-37. T.D. 3,525 ft.; F. 20 B.O.P.H.

Richmond Drlg. Co. No. 2-A State, C SW SW Sec. 2-25-37. T.D. 3,414 ft.; F. by heads; F. 220 B.O. in 7 hrs.

Sam Weiner No. 3 Smith, C N½ NE SE Sec. 4-25-37. T.D. 3,506 ft.; C.O.

Stanolind O. & G. No. 1-B Gregory, C SW NW Sec. 15-26-37. Loc.

Eddy County

Allen, Fair & Pope No. 1 Snowden, SE NE SE Sec. 36-17-29. T.D. 2,671 ft.; W.O.C.

B. L. Arnold No. 1 Arnold, NW NW NW Sec. 34-17-30. Drlg. 325 ft.

Aston & Fair, Inc., No. 1 Hudson, C NE NE Sec. 18-17-31. Drlg. 3,090 ft.

W. H. Berry No. 1 Berry, NE NE NE Sec. 24-17-27. S.D. rprs. 548 ft.

Hammond & Sons No. 1 Ployhar-State, SW SW SE Sec. 16-17-28. T.D. 1,971 ft.; P.B. 1,825 ft.; shot & res. 100 ft. O.I.H. in 30 min.

J. O. and J. H. Hammond No. 1 Paris, NE NW NW Sec. 5-17-29. S.D.O. 25 ft.

Flint Prod. Co. No. 1-L Dexter, SE NW SE Sec. 15-17-30. Drlg. 3,809 ft.

Grayberg Oil Co. No. 12 Burch, NW NW SE Sec. 19-17-30. Spdg.

Ohio Oil Co. No. 4 State-McCallister, Sec. 25-17-34. W.O.C. 510 ft.

Plains Prod. No. 1 Daugherty (wildcat), SE SE SE Sec. 11-17-27. S.D. rprs. 215 ft.

C. S. Powell No. 1 Smith, NW NW NE Sec. 6-17-29. T.D. 2,845 ft.; to P.B.

Repollo Oil Co. No. 5-A Parke, NW NE NW Sec. 22-17-30. Drlg. 2,795 ft.

Repollo Oil Co. No. 4-A Keel, SE NE SW Sec. 7-17-31. Drlg. 2,993 ft.

Repollo Oil Co. No. 3 West, NE NE NE Sec. 3-17-31. Drlg. 1,485 ft.

J. H. Steinberger No. 2 Hastie, SW SW SW Sec. 18-17-28. R.U.R.

Welch & Welch No. 1 State, NE NE SE Sec. 20-17-28. T.D. 1,970 ft.; R.U. pump.

Adkinson Oil Co. No. 1 Brainard, SE SW SE Sec. 5-18-27. S.D. reprs. 1,650 ft.

Barney Cockburn No. 1 State-Graham, C NE NE Sec. 16-18-31. Drk.

Etz & Cone No. 1 Nelson, SE SE NE Sec. 10-18-30. R.U. mch.

Farmer & Tallmadge No. 1 Hubbell, NE SW Sec. 4-18-25. T.D. 400 ft.; W.O. underreamer.

Franklin Pet. Corp. No. 1 Canfield, NW NW NW Sec. 7-18-30. M.I.M.

Franklin Pet. Corp. No. 1 Cappedge, NW SW NW Sec. 5-18-30. W.O.C. 457 ft.

Green Bay Oil No. 1-A Johnson, C SE SE Sec. 11-18-31 T.D. 3,775 ft.; P. 15 B.O. in 12 hrs.

Chaves County

Mac T. Anderson No. 1 Warnock, C SW SE Sec. 17-15-27. Drlg. 725 ft.

Comanche Drlg. No. 1 Campbell, NE NE NW Sec. 15-11-26. Drlg.

Nay Hightower No. 1 Billingslea, C SW NE Sec. 28-11-30. T.D. 3,290 ft.; O.I.H.; S.D.; tbg.

New, Russell & Wood No. 1 Sterrett (wildcat), NW SE NW Sec. 29-11-25. S.D. reprs. 160 ft.

Tarkenton Bros. No. 1 Peters, SE SE NW Sec. 33-11-25. Drlg. 399 ft.

Western Minerals, Inc., No. 1 Dow (wildcat), C SW NW Sec. 27-10-30. Loc.

De Baca County

N. E. Woods No. 1 Jones, C NE SW Sec. 17-4n-20. T.D. 620 ft.; S.D. rprs.

James D. Ward No. 1 Summers, SE NE SW Sec. 15-4n-24e. T.D. 680 ft.; S.D.O.

Luna County

O. D. Berry No. 1 Berry, SE SE SW Sec. 33-22s-10w. Drlg. 140 ft.

Roosevelt County

Shell Oil Co. No. 1 Harwood, C S½ SE SE Sec. 27-7s-35e. Drlg. 7,605 ft.; L. and sd.

NORTHWEST NEW MEXICO

San Miguel County

Ben E. Keith No. 1 McCune, SW SE SW Sec. 32-16n-12e. T.D. 10 ft.; ran 1 jnt. 10-in.

Southwest Drlg. Co. No. 1 Conchas, NW NE Sec. 34-17n-21e. Drlg. 1,600 ft.

Valencia County

C. A. Grober et al No. 1 Fuqua, NE NE Sec. 19-5n-3e. Cg. below 1,450 ft.

Joiner Oil Corp. No. 1 San Clement, C NE SE Sec. 23-7n-1e. T.D. 5,606 ft.; trying to loosen frozen D.P.

COLORADO

Boulder County

Reynolds & Rohr No. 1 Thomas, SW SW Sec. 17-1n-70w. T.D. 1,861 ft.; tstg. S.O.&G. in basal Hygiene.

Fremont County

Waterville Oil Co. No. 1 Persons, CWL NE NE Sec. 17-18s-69w. U.R. for W.S.O. at 65 ft.
Isadore Spangler No. 1 St. Marys, SE SE SE Sec. 2-19s-70w. T.D. 2,040 ft.; R.U. to D.D. from 2,040 ft. where completed last May for 75 B.P.D.

La Plata County

Nick Spatter No. 1-X Bryce, SE SW SW Sec. 31-33n-9w. T.D. 2,352 ft.; fsg. for 8¼-in. parted at 630 ft.

Moffat County

MacKinnie Oil & Drlg. Co. No. 1 Coles, SW SW SE Sec. 1-3n-92w. Drlg. 3,175 ft.; 8¼-in. at 3,150 ft.

Park County

South Park Oil Co. No. 1 Leman, NE NE SE Sec. 34-11s-75w. Drlg. 6,895 ft.

WYOMING

Big Horn County

Yale Pet. Corp. No. 2 Yates, Lot 57 (NW SW) Sec. 34-56n-97w. Drlg. 1,595 ft.; cmtd. 10¾-in. at 1,354 ft.; 500 sacks.
Mule Creek Oil Co. No. 1 Sessions, Lot 53 (NW NW) Sec. 34-56n-97w. T.D. 1,857 ft.; cmtd. 10¾-in. at 1,831 ft.; W.O.C.
Libby-Keoughan No. 1 Sheets, SE NE SE Sec. 9-55n-96w. T.D. 3,440 ft.; C.O. 200 ft. off bttm.
A. L. Rankin No. 1 Karjala-Rankin, C SW NW Sec. 10-54n-94w. Drlg. 660 ft. (last report).

Carbon County

Sinclair-Wyo. Oil Co. No. 2-A Mahoney Unit, C SW NE Sec. 34-26n-88w. T.D. 4,326 ft;. fsg. D.P.
Producers Oil Co. No. 1 Lake Valley, CNL Sec. 14-20n-88w. Drlg. 1,940 ft.

Converse County

W. W. Austin and others No. 1 Pfister, SW NE NW Section 20-32n-68w, in the shallow Shawnee district, is a near completion at 712 feet, where it is showing for a gas well, estimated at several million feet. It is running 5⅛-inch to test. Location is approximately 2 miles east and north of the New Era Fuel Co. No. 1 Brown-Government, NW SW NW Section 25-32n-69w, completed early in 1938 at 505 feet for 2,800,000 cu. ft., the nearest producer. The shallow production trends to the southwest 6 miles from No. 1 Brown-Government, the area being very spotted.

Fremont County

Consolidated Oil Properties No. 3 Ewart, C SW SE Sec. 16-1n-1w. T.D. 1,245 ft.; rng. 8⅝-in. to test S.O. before D.D.
Frank Pouppirt No. 2 Fidelity Tr., NW NW SW Sec. 27-3n-1w. S.D. 1,200 ft.

Niobrara County

As a result of an improvement in the demand for Lance Creek crude and a favorable outlook for a further expansion this spring, operators in the field are preparing to enter upon a more extensive drilling campaign. Negotiations are reported pending between the Standard Oil Co. of Indiana and operators in the unit agreement for the sale of 5,000 bbls. per day of Leo sand production to the Standard company for shipment to the Chicago refining district, the contract to run for several years. Standard at present has a contract calling for 5,000 bbls. per day of Sundance crude. It is shipping 4,000 bbls. under a modified agreement which provides for it taking the other 1,000 bbls. under the contract at a later date. Standard of Indiana is mixing the Lance Creek crude with storage oil from the Clayton tank farm where it had 11,000,000 bbls. in storage when the line to the East was put into operation about three years ago. While figures are not available, it is estimated that about half of the Clayton storage has been run to market.

The Wasatch Refining Co., which operates a plant at Woods Cross, Utah, near Salt Lake City, is now reported taking 600 bbls. a day of Leo crude under a contract with the Ohio Oil Co. This order replaces crude which heretofore it has been buying in Texas. In addition, the Wasatch company also is buying Lance Creek crude for its plants at Pocatello, Idaho.

As a result of the prospects for a much larger market, which will throw Lance Creek production into first place in Wyoming, the operating committee for the unit at a meeting in Casper recently decided upon a more extensive drilling campaign. A number of wells to both the Sundance and Leo horizons will be drilled under this program to augment the supply of crude, the rapidity with which they will be drilled depending upon available water supply for rotary rigs. At this meeting the Argo Oil Co. was designated as the operator for the government lease purchased by the unit at auction in the NW SW Section 8-35n-65w, and a west offset to the Adams No. 1 Baker will be started within a few weeks. Argo also was designated operator on the Ong lease in the SE SW Section 31-36n-65w, where a well to the Leo sand will be drilled. The unit's interest in this lease is divided among the operators on the basis of their interests in the participating area.

The participating area has been revised as a result of some extensions of the Sundance sand and extended to the Leo sand. The total area for the Sundance is at present 1,714.9 acres, increased from 1,600.3 acres last fall. The Leo participating area now embraces 2,332.4 acres. The interests in the Sundance participating area on the revised figures are Ohio Oil Co., 43.6 per cent; Argo Oil Co., 17.9 per cent; Continental Oil-Buck Creek Oil companies, 38.5 per cent. The division on the Leo sand now is, Ohio, 42.4 per cent; Argo, 19.2 per cent; and Continental, 38.4 per cent.

Ohio Oil Co. No. 12 Carrie Putnam, NW SW NW Sec. 4-35n-65w. T.D. 450 ft.; cmtd. 11¾-in. at 286½ ft.; W.O.C.
J. E. Manning No. 1 Hewitt-Govt., NW SW SW Sec. 4-35n-65w. Prep. to spd.
Minnelusa Oil Corp.-MacKinnie O. & D. Co. No. 5 Thompson, SE SE NW Sec. 7-35n-65w. Drlg. 700 ft.
Ohio Oil Co. No. 3 Agnes Rohlff, C SE NE Sec. 32-36n-65w. Drlg. 5,090 ft.
Continental Oil Co. No. 3-B Dielman, SW SE NW Sec. 8-35n-65w. Drlg. sh. 2,539 ft.
Continental Oil Co. No. 2 E. Rohlff, NW SE NW Sec. 32-36n-65w. Drlg. 3,682 ft.
Minnelusa Oil Corp. No. 2 Joss, SE NE SW Sec. 6-35n-65w. Drlg. 4,278 ft.
Minnelusa Oil Corp. No. 3 H. & M.-5, NW NE SE Sec. 7-35n-65w. Drlg. below 5,100 ft.
F. F. Hintze et al No. 1 Wright-Govt., C NW SE Sec. 30-36n-63w. T.D. 4,964 ft.; P.B. to 4,190 ft.; redrld. to 4,245 ft.; rng. pkr. to test Dakota.
Fall River Roy. & Prod. Co. No. 1 Govt., CSL SE SE Sec. 35-40n-61w. T.D. 1,000 ft.; fsg. bailer.
Continental Oil Co. No. 1 Delahoyde, CNL NE NE Sec. 25-37n-63w. Drlg. sdy. sh. 4,140 ft.

Sublette County

Texas Co.-Frontier Pet. Co. No. 1 Govt. Unit, SE SE SW Sec. 1-28n-114w. S.D. 6,545 ft.

Sweetwater County

The Sinclair-Wyoming Oil Co. No. 82, NE SW SW Section 11-26n-90w, Lost Soldier field, was completed at 2,217 feet for 100 bbls. per day on gas-lift from the Sundance sand, topped at 1,962 feet. The 5½-inch was cemented on bottom and perforated with 108 holes.

Sinclair-Wyo. Oil Co. No. 83 Lost Soldier, NW NE NE Sec. 10-26n-90w. Drlg. sh. 1,383 ft.
Salegna Oil Co. No. 1 Union Pacific, C SW SW Sec. 10-20n-104w. T.D. 5,230 ft.; prep. to set whipstock at 2,900 ft. and drill by.

Weston County

Whedon and others No. 1, C SW NE Section 21-46n-64w, which gives promise of extending the Osage field a mile to the west, is swabbing to exhaust the drilling fluid and is showing some oil. Corrected total depth is 3,953 feet. The 4¾-inch is at 3,888 feet, but will not be cemented until after a Schlumberger test is run to locate the sands.

Union Trust Oil Co. No. 1 Hockett, NE NE Sec. 23-47n-64w. Drlg. below 60 ft.; (first report).
Whedon et al No. 1, C SW NE Sec. 21-46n-64w. T.D. 3,953 ft.; swbg.
Root et al No. 1 Robey, CSL NW SW Sec. 19-45n-61w. Spdg.
John Brorphy No. 1 George, SW SE NW Sec. 26-48n-64w. Res. at 2,304 ft.
Lem Johnston No. 1, NW SW Sec. 24-44n-63w. Drlg. below 2,600 ft.
F. P. Dilger et al No. 1, CEL SE SE Sec. 25-46n-64w. Spdg.
Selby & Langford No. 2, NW SE NE Sec. 6-46n-63w. Drlg. below 460 ft.; showing for comml. well in sh.

MONTANA

Glacier County

There were two completions and three new operations in Cut Bank. The Santa Rita Oil & Gas Co. No. 9 Tribal, NE SE NE Section 16-35n-6w, one-fourth of a mile northeast of No. 1 Lander, the record producer in the field, flowed 70 bbls. per day from 2 feet of Moulton sand, and was dry in the Sunburst and Cut Bank. It was completed at 2,985 feet, total depth. The 7-inch was cemented at 2,882 feet and 72 feet of 5⅛-inch liner was run to 2,955 feet. The Moulton sand was at 2,871-74 feet with saturation at 2,882-84 feet. The Sunburst was dry at 2,900-35 feet. The Cut Bank was at 2,940-65 feet and 2,965-80 feet. Elevation, 3,886 feet.

The Glacier Production Co. No. 1 Bliesener Unit, SE SE NE Section 3-33n-5w, was completed for 14,048,000 cu. ft. of gas per day at 2,659 feet, total depth. The Sunburst at 2,565-2,625 feet, was dry. The Cut Bank was at 2,635-55 feet.

The Yukon Oil Co. No. 2 Lungren, south offset to the discovery well in North Cut Bank, had approximately 150,000 cu. ft. of gas and sprays of oil from the Moulton sand at 2,500-79 feet, the showing being at 2,572-79 feet. It was drilled on down to the Cut Bank and is in process of completion.

Santa Rita O. & G. Co. No. 4 Ritchie, C NW NW Sec. 5-33n-5w. R.O.G.
Tarrant-Wiley No. 2 Connolly, C SW NE Sec. 31-34n-5w. R.O.G.
Tarrant-McLellan No. 2 McLellan, C SW SE Sec. 12-34n-6w. R.O.G.
Texas Co. No. 6 Unit 9, C SW NW Sec. 9-32n-5w. Drlg. 250 ft.
Glacier Prod. Co. No. 1 Callison Unit, SE SE NW Sec. 27-34n-5w. Spdg. 90 ft.
Glacier Prod. Co. No. 2 McDougal, C SW NW Sec. 31-34n-5w. Drlg. 435 ft.
Glacier Prod. Co. No. 3 Miller, C NE NE Sec. 29-33n-5w. Drlg. 1,325 ft.; Colo. 695 ft.; 10¾-in. 717 ft.
Tarrant-Wiley No. 3 Jones, SW NW SW Sec. 31-34n-5w. Drlg. 1,200 ft.; Colo. 470 ft.; 10¾-in. 501 ft.
Tarrant-Long No. 7 Miller, NE SW NE Sec. 24-34n-6w. Drlg. 2,830 ft.
Yukon Oil Co. No. 2 Lungren, C NE NW Sec. 26-37n-5w. Rng. 7-in. at 2,700 ft.
Wm. Hanlon No. 4 All.-128, SW SE NE Sec. 12-32n-6w. Top Cut Bank 2,940 ft.; S.O. at 2,960 ft.; shot 75 qts.; D.D. to 2,976 ft.; shot with 230 qts.; will C.O. and run 7-in.

Teton County

Zodiac Oil Co.-Gulf States Oil Co. No. 1 Kellogg, NE NW NE Sec. 33-28n-5w. Drlg. 2,640 ft.

Toole County

Kevin-Sunburst had four completions and one new operation. The most interesting completion was Fulton-Commonwealth No. 2 Thompson, SE NW SE Section 28-35n-3w, which had a good show of oil and gas in the contact at 1,707-28 feet before it was acidized with 1,000 gallons. After acidizing it started to flow, but the oil decreased and gas increased until it finally gauged 5,000,000 cu. ft. of gas and very little oil. This was an unusual result and No. 1 Thompson, on the north, which was completed last year as an oil well, evidently benefited from acidization of No. 2 and increased its output.

Coolidge & Coolidge No. 3-A State, NW NE NW Section 36-36n-2w, is pumping 30 bbls. per day from the Sunburst at 1,505-1,605 feet.

G. M. Plotke No. 2 Ward, SW cor. Section 28-35n-3w, is pumping 15 to 20 bbls. daily from the contact at 1,689-95 feet without acidizing. It will be acidized later.

A. E. Crumley & Son No. 15 Fryberger, NE NW SE Section 24-35n-3w, is pumping 8 bbls. per day from the top of the contact at 1,621 feet, and will be acidized later.

Big West Oil Co. No. 8 Dalquist, SW NW NE Sec. 28-35n-3w. Drlg. 1,150 ft.; wtr. at 890-1,030 ft.; 10-in. at 1,031 ft.
K. C. Morton No. 1 Govt., SW SW SE Sec. 1-35n-3w. T.D. 1,556 ft.; prep. to D.D.
G. & A. Oil Co. No. 14 Goeddertz, NE SE SW Sec. 23-35n-3w. Drlg. 1,020 ft.
Big West Oil Co. No. 10 Gunderson, 1,980 ft. from WL and 1,100 ft. from NL, Sec. 19-35n-2w. T.D. 1,610 ft.; contact 1,608-10 ft.; tstg.
Superior Pet. Co. No. 11 Govt., CEL NW SW Sec. 12-35n-3w. Drlg. 1,770 ft.
Kippen O. & G. Co. No. 1 Thompson, C NE SE Sec. 28-34n-1e. Drlg. 1,740 ft.

UTAH

Cane Creek Oil Co. No. 1 Govt., NW SW Sec. 31-26n-21e. Drlg. blk. stky. sh. 3,170 ft.; S.G. through H. F.W.

Oklahoma Fields

(Continued from Page 73)

7-5, was completed for 54 bbls. of oil daily at 4,130 feet, total depth.

W. A. Delaney and others No. 1 Bruno, SE NE SE Section 31-7-5, found dolomite at 4,051 feet, total depth 4,156 feet, was acidized with 4,000 gallons and made daily potential of 540 bbls. of oil.

S. K. Vierson No. 2 Palmer Estate, SW SE NW Section 32-7-5, topped dolomite at 4,101 feet, total depth 4,205 feet, was treated with 4,000 gallons of acid, and had initial daily production of 124 bbls. of oil.

Same operator's No. 3 Palmer, NE SE NW Section 32-7-5, was completed for 155 bbls. of oil daily after acidizing with 8,000 gallons. Dolomite was topped at 4,115 feet and the hole was bottomed at 4,190 feet.

Alma Oil Co. No. 6 Smith, NE SW NE Section 32-7-5, an old well, was deepened from 4,069 feet to 4,140 feet, plugged back to 4,085 feet, and recompleted for daily yield of 140 bbls. of oil.

J. E. Trigg No. 1 Vanselous, NE NE SE Section 32-7-5, an old well, was recompleted for 700 bbls. of oil daily after deepening from 4,072 feet to 4,170 feet.

New work in Pottawatomie County: F. C. Summers No. 1 Boyd, SW SE SW Section 28-7-5, rig on ground; Kerlyn Oil Co. No. 1 School Land, NW NW NE Section 36-7-3e, St. Louis, spudded; Black Gold Oil Co. No. 1 Terrell, C NW NW Section 14-7-3, rig on ground; Indian States Oil Co. No. 1 Santer, SE cor. Section 31-11-4, Shawnee area, spudded.

Lincoln County

Cooper Drilling Co. No. 3 School Land, SW SE NE Section 16-14-6, Sac and Fox pool, Lincoln County, had Prue sand at 2,988 feet, total depth 3,087 feet, was shot and initialed 95 bbls. of oil daily.

Mudge Oil Co. No. 2 Tetters, SE SE NE Section 9-14-6, topped Prue sand at 3,079 feet, total depth 3,148 feet, was shot and produced 50 bbls. of oil daily.

Big Chief Drilling Co. No. 1 Christian, SE NE NE Section 3-14-2e, was abandoned at 5,058 feet, total depth.

Indian States Oil Co. No. 1 Bailey, NW NW NE Section 2-12-5e, an old well in the Wilzetta area, was deepened to 4,243 feet and recompleted for 80 bbls. of oil daily.

Seminole County

Sunray Oil Co. No. 1 Millsap, NW SW SW Section 7-6-6, Grayson area, Seminole County, topped dolomite at 3,725 feet, total depth 3,800 feet, was acidized with 10,000 gallons and had initial daily yield of 240 bbls. of oil.

Simpson & Roodhouse No. 1 Gassoway, SE NE NE Section 14-6-5, was dry and abandoned at 2,863 feet, total depth.

Terry & Evans No. 1 Scroggins, NW SW SW Section 3-6-6, was completed at 2,904 feet, total depth, and produced 11,000,000 cu. ft. of gas daily.

Rogers & Rogers No. 2 Fisher A, SE NW SW Section 25-7-5, Hazel district, found Senora sand at 2,655 feet, total depth 2,964 feet, was shot and initialed 165 bbls. of oil in 24 hours.

Same operators' No. 1-A Fisher B, SW SW SW Section 25-7-5, was deepened from 2,970 to 2,980 feet, was shot, and recompleted for 24 bbls. of oil daily.

Atlantic Refining Co. No. 1 Norvell, SW NW NW Section 21-7-6, West Little River area, found Wilcox sand at 4,351 feet, was bottomed at 4,357 feet, and had initial production of 418 bbls. of oil daily.

Commercial Drilling Co. and others No. 1 Billington, SE NE SW Section 28-7-6, Dora area, was dry and abandoned at 2,348 feet, total depth.

Cities Service Oil Co. and others No. 3 Fish B, NE SW SE Section 19-7-8, an old well in the Fish pool, was deepened from 3,102 feet to dolomite at 4,100-48 feet, total depth, and recompleted for 24-hour potential of 1,313 bbls. of oil.

Charles McMahon No. 1 Haite, C N half NE NE Section 34-10-6, Searight area, was a rig. H. S. Moss No. 1 Haite, C S half NE NE Section 34-10-6, was a cellar. J. A. Ligon No. 2 Logan, NW SW NE Section 25-8-7, had spudded. Same operator's No. 1 Patterson, SW SE SE Section 24-8-7, was a location.

Hughes-Creek-Okmulgee Counties

Amerada Petroleum Corp. and others No. 1 Adams, SW NE SW Section 31-9-9, Adams pool, Hughes County, was dry and abandoned at 4,148 feet, total depth.

Holifield and others No. 1 Howard, SW NE NW Section 32-14-14, Okmulgee County, was bottomed at 1,739 feet and gauged 5,000,000 cu. ft. of gas daily.

L. Abraham No. 1 McIntosh, NW NW NE Section 7-16-10, Creek County, had Red Fork sand at 2,145 feet, total depth 2,308 feet, and produced 20 bbls. of oil daily.

J. Garfield Buell No. 1 Walker, SW NW SW Section 15-14-10, was abandoned at 3,396 feet, total depth.

Fortner and others No. 2 Quinn, NW NE SE Section 27-19-10, was dry and abandoned at 2,021 feet, total depth.

Southwestern Oklahoma

Ray Stephens, Inc., No. 1 Huron, SE SW NW Section 26-6-10w, Cement field, Caddo County, was completed for 20 bbls. of oil daily at 5,528 feet, total depth.

Mudge Oil Co. No. 20 Crosby, SE NE SW Section 23-1s-5w, Velma area, Stephens County, found sand at 469 feet, total depth 491 feet, and produced 263,000 cu. ft. of gas daily.

A. Kriss and others No. 1 Fitzgerald, NW NE NE Section 7-1s-19w, Tipton area, Jackson County, was dry and abandoned at 2,668 feet.

George L. Pace No. 11-B Houston, SW NE SW Section 2-2s-8w, Empire field, Stephens County, was dry and abandoned at 2,178 feet.

Joe Barrett No. 19 Hinkle, NE SE NW Section 20-3s-2w, Wheeler pool, Carter County, was completed as a 2-bbl. pumper at 239 feet, total depth.

New work in Caddo County: Ohio Oil Co. No. 6 Bruce, SE SW NE Section 11-5-9w, cellar and pits; Ray Stephens, Inc., No. 1-A Curtin, SE SW NE Section 26-6-10w, cellar and pits; Phillips Petroleum Co. No. 2 Alery, SE SE NE Section 34-6-10w, location; Tom Palmer Oil Co. No. 2 Sterba, NW NW SW Section 35-6-10w, cellar and pits; Ohio Oil Co. No. 3 Bigby, NE SE NE Section 10-5-9w, cellar and pits.

In the Altus area, Jackson County, Hal Vaughn No. 1-A Stoker, NW SW SW Section 11-1n-20w, material on ground.

In Carter County, Jones Brothers No. 7 Carter, SW NW NE Section 16-4s-3w, machine.

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By
GEORGE WEBER

Deep Oil in Shongaloo Pool May Lead to More Drilling

SHREVEPORT, La., Apr. 10.—Discovery of deep oil production in the Shongaloo field of Webster Parish, North Louisiana, highlighted developments of the week in the tristate fields. In addition, wildcats and important outpost tests reaching critical depths were being closely watched. The Shreveport field added three new oil wells, with drilling activity at its height. Cotton Valley drilling brought in an oil producer from the Holloway sand. Mississippi activity, though still lagging, may be given impetus from a show of oil in a Madison County test, which made a drill stem test last week. Possibility of discovery of oil production, is, however, unknown at this time.

Shongaloo Well

Magnolia Petroleum Co. No. 1 Roseberry Unit, 20 feet north and west of center, of the SE Section 29-23-9, in northern Webster Parish, was flowing oil as a result of a plug-back job. The well was carried to a total depth of 9,380 feet in search of the gas and distillate sand which is producing in two Magnolia wells in the Shongaloo field.

At first the well flowed 21 bbls. of distillate, together with 146,000 cu. ft. of gas in a 15-hour test through a 1-inch choke. It was then plugged back from the Sexton sand at 9,253-55 feet and 9,314-61 feet, to 9,250 feet, and 5-inch casing was perforated at 9,150-87 feet with 50 shots. The well was swabbed down to 5,000 feet from the top and a showing of oil was found. The well was shut in over night, and the next morning upon opening, it flowed a head of oil and wash water. It was swabbed back in and flowed 17 bbls. per hour of oil and wash water, through a half-inch choke, with tubing pressure of 200 pounds and casing pressure of 700 pounds at an estimated gas-oil ratio of 1,100 to 1. The gravity of the oil was 49.8 degrees. The well made 144 bbls. of oil, mud and water, on various sized chokes, in 22 hours of flowing time. At the week-end it was reported to have ceased flowing, and was being rocked with high-pressure gas from one of the gas-distillate producers in the field. This marks the first oil production in the deep Shongaloo zone, and may lead to considerable development of the deep possibilities of the old shallow gas field.

Another deep test in Webster Parish, Union Producing Co. No. 1 Walker Unit, in the SE Section 30-18-8, in the Sibley-Dubberly area, was drilling in hard shale and sand below 8,990 feet. The test is projected to the lower Marine section, which produces in the Bodcaw and "D" sands of the Cotton Valley field. The lower Marine is expected at about 9,300 feet in the Sibley well, and operations of the deep wildcat will be watched with considerable interest during the next several days.

Cotton Valley

A new Holloway sand oil well was brought in in the Cotton Valley field of Webster Parish. Hassie Hunt No. 11 Davis gauged 150 bbls. daily through a three-eighths inch choke, with tubing pressure of 250 pounds and casing pressure of 550 pounds. A string of 9⅝-inch casing was set at 5,610 feet and the total depth is 5,950 feet.

In Claiborne Parish, a completion in the Homer field marked the first well addition in that field in several weeks. Sinclair-Prairie Oil Co. No. 10 Langston gauged 6 bbls. daily on the pump from sand at 1,348-63 feet, and will be placed on a vacuum to increase production.

Shreveport Field

The Shreveport or Cross Lake field, the most active in the tristate area, added three wells during the week. R. E. Allison No. 1 Harmon, on the south edge of the field near Cross Lake, gauged 524 bbls. daily through a half-inch choke, with casing pressure of 1,210 pounds and tubing pressure of 820 pounds.

Leon Dunn No. 1 Nelson, on the northeast edge, made 22 bbls. hourly through a half-inch choke, with tubing pressure 150 pounds and casing pressure 500 pounds. The third well, W. C. Feazel No. 1 Hunter, a north edge test, came in making 13 bbls. hourly through a half-inch choke with tubing pressure 150 pounds and casing pressure 400 pounds.

A drilling well in the field, Lake Production Co. No. 1 Herndon and others, on the east edge of Cross Lake, threatened to blow out, with high-pressure gas from the Woodbine sand. The pressure was killed with mud, and the well is under control. This is the first threat of a blowout since the early period of the field's development, when R. L. Bauman No. 1 Slattery, and the Rodessa Oil & Refining Co. No. 1 Chandler got out of control in the shallow gas sand.

East Border Texas

Two wildcats are being watched in the border counties of East Texas. McDaniels No. 1 McDaniels, an outpost to the Joaquin field of Shelby County, was coring in the lower Glen Rose, after failing to show oil in a section above the gas distillate horizon. The field consists entirely, to date, of gas distillate production, although showings of oil have been found in previous wells. Colored distillate has been mistaken in some reports of earlier wells, as crude, although it is produced at excessive gas-oil ratios, and such production is forbidden by conservation laws, unless it is processed and recycled through the local pressure maintenance project.

In Harrison County, Arkansas Louisiana Gas Co. No. 1 Jim Davis, in the Waskom field, is drilling in anhydrite and shale below 4,700 feet, being projected to the deep horizon which is producing high-pressure gas and distillate in an earlier well of the same company.

Mississippi Oil Show

Union Producing Co. No. 1 Anderson, a wildcat in the Flora district of Madison County, about 15 miles north-northwest of Jackson, reported a showing of oil the past week. The test, in Section 12-8n-1w, made a drill stem test at 4,401-37 feet, and a showing of oil and salt water was reported. The hole was being cored below 4,770 feet in chalk. The top of the chalk was found at 4,348 feet.

During the past month two tests in Mississippi, located in Simpson and Yalobusha counties, were abandoned, and abandonments in the southeastern states also included one in Barbour County, Alabama, and Lake County, Florida. The leasing play in the Northwest Alabama basin is gaining momentum, and drilling is expected to begin within the next few months.

Report From Alabama

A report received from Walter Sistrunk, of the Mid-Southern Petroleum Co., Inc., dated Decatur, Ala., April 7, says in part:

"Mid-Southern Petroleum Co., Inc., of Dallas, has temporarily abandoned location for No. 1 Rob Jacobs, SW SE Section 11-7-7, in Lawrence County, Alabama, and has moved southeast 3 miles.

"Mid-Southern No. 1 W. R. Jackson, 150 feet south of north line and 500 feet west of east line in Section 30-7-6, Lawrence County, moved in standard rig from a location in Kentucky, and commenced drilling April 1. At end of Friday, April 7, the well was drilling below 148 feet, in Bangor lime, in exceptionally hard formation, having drilled in this formation for the last 130 feet.

"The well is on a very apparent domal anticlinal structure about 4½ miles long and over 2 miles wide, and is 3 miles southeast of old Fidelity Oil & Gas Corp. No. 1 J. R. Jacobs, which had a 5-foot gas section from 620-25 feet, a 7-foot oil section from 790-97 feet, and a 50-foot lime section showing oil at 874-924 feet, and which is still making considerable gas through a hole full of water after 11 years. It is only three-quarters of a mile northwest of Goyer No. 1 Pruitt, listed by Alabama and U. S. Geological Surveys as being the only well in Alabama to ever establish sustained commercial production, which production was 25 to 40 bbls. daily flowing from 20 feet of sandy, coarse-grained, siliceous limestone found at 1,509-29 feet, in the Trenton.

"Mid-Sountern is looking for production in either of the sections logged in the Fidelity Oil & Gas Corp. well, and particularly for the formation found in the Goyer well just southeast of Mid-Southern's location.

"The company has also under lease several blocks in Walker, Fayette, Marion, Franklin, and Lamar counties, and is planning a wildcat program to last throughout 1939."

Production by Pools

Estimated daily gross production, all companies, week ending April 7.

NORTH LOUISIANA

	Bbls.
Bellevue	700
Caddo, light	4,150
Caddo, heavy	2,470
Converse	530
Cotton Valley, heavy	100
Cotton Valley, light	*12,690
Cross Lake	3,845
De Soto and Red River	1,110
Elm Grove	260
Haynesville	2,885
Holly	65
Homer	2,665
Lisbon	6,210
Pleasant Hill	90
Rodessa	28,650
Sarepta-Carterville	†405
Sligo	710
Sugar Creek	280
Urania	2,725
Zwolle	2,915
Total North Louisiana	73,455

SOUTH ARKANSAS

Atlanta	‡240
Buckner	1,655
Champagnolle	1,800
El Dorado	1,715
Lisbon	245
Magnolia	4,320
Miller County	350
Nevada	590
Rodessa	5,015
Schuler	18,100
Smackover, light	1,900
Smackover, heavy	15,030
Stephens	510
Troy	970
Urbana	1,185
Village	560
Total South Arkansas	54,185

Texas side of Rodessa field 30,555 bbls. daily. *4,545 bbls. is distillate. †145 bbls. is distillate. ‡Atlanta field located in Section 15-18s-19w, Columbia County, Arkansas. One well producing 44-gravity oil.

Eastern Fields

(Continued from Page 78)

district. In Braxton County, Pittsburgh & West Virginia Gas Co. on the T. Nottingham farm in Birch district, elevation 791 feet. In Clay County, Thompson Gas Co. Nos. 13 and 14 on the Thompson Land & Coal Co. In Pleasant district, elevations 1,379.9 feet and 1,150.8 feet. In Gilmer County, Pittsburgh & West Virginia Gas Co. No. 3 Granville Collins in Glenville district, elevation 1,173 feet. Carnegie Natural Gas Co. on the D. J. Rexroad farm, elevation 1,310 feet.

Michigan Field Report

Extend Allegan Salem Field; Van Buren's 1,000-Bbl. Well

By O. C. PRESSPRICH

SAGINAW, Mich., Apr. 10.—An important easterly extension of the old Salem field and an indication of a probably important connection between the Bloomingdale and Columbia fields in Van Buren County were among the past week's significant developments engaging the attention of Michigan oil operators.

While several wildcat tests in southern Michigan were unsuccessful, increasing the proportion of failures among the latest batch of completions, the speeding up of development was indicated in the fact that the week saw 24 wells completed, the largest number in weeks. Meanwhile the promise of continued intensive activity with the coming of spring showed up in the 23 permits for new drillings issued the past week by the state Conservation Department.

The extent to which Van Buren's Bloomingdale pool development continues to dominate the Michigan oil picture was further revealed as the state Tax Commission made public in Lansing the state's production and severance tax figures for February.

Bloomingdale's oil wells that month produced 139,000 bbls. more than the Buckeye field in Gladwin County, although total production in both counties showed some decrease from the January figures. Total output from the Van Buren wells was announced as 424,072 bbls. in February, the value being $318,735, while the Buckeye totals were 258,015 bbls. valued at $232,213. The severance tax amounted to $30,112, compared with $31,587 in January, as the state's total production was announced as 1,612,529 bbls., worth $1,340,200. February also was the second consecutive month that sale of Michigan gas exceeded a billion cubic feet. The total was 1,178,191,000 cu. ft., having a value of $165,380. That the developing Kent County field, west of Grand Rapids, is increasing in importance also was shown by the severance tax figures as returns to that county and its Wyoming and Walker townships climbed to an even $100 for the month.

Salem Field Extended

The extension of the old Salem field in Allegan County was a Michigan Devonian Petroleum Co. contribution to the development in that southwestern Michigan area. Completed at 1,584 feet, the well was acidized with gratifying results. The first gauge of production showing 790 bbls. in 24 hours, despite the fact that the well was pinched in all but four hours of that time.

Meanwhile, in Bloomingdale Township the successful completion of F. Caldwell No. 1 Leahy in Section 18 was taken to mean a close bond between that and the Columbia fields. The well was a westerly extension of the Bloomingdale producing area, separated from the Columbia by a space of about 2 miles. Other wells are in progress in that stretch which will shortly prove what the Caldwell discovery predicts.

In Bangor Township of Van Buren County an exploration located in Section 26, about 2½ miles from any production, was given up as a failure as Christ Shrock abandoned the No. 1 Church as a dry hole after it had been drilled a total depth of 1,055 feet.

Weber Oil Co., wildcatting in Section 23 of Foster Township in Ogemaw County, went down more than 2,950 feet before giving up the attempt on its state land lease. Other wildcat failures were in Barry and Clinton counties. In Section 31 of Otsego Township, Allegan County, American Drilling Co. ran into a disappointment as No. 1 John Lovett, getting a show of oil at 1,386 feet, was deepened to 1,674 feet without results.

Kent County interest was given another boost as Swanson Consolidated Oil Co. completed a well in Section 32 of Walker Township that was good for 350 bbls. of oil a day after acid treatment, and the Gordon Oil Co., completing another in Section 5 of Wyoming Township, acidized its well to lift daily production to around 800 bbls. Both completions are offsets to producing wells.

With Van Buren again the scene of the big share of new drilling permits for the week, the list of 23 given by the Michigan Conservation Commission revealed intentions to wildcat in Barry, Cass and Ionia counties and efforts to extend producting fields. Of Van Buren's 14 permits, eight were for the Bloomingdale region, two for Columbia, two for Bangor, two for wildcats in Pine Grove Township. The rest were scattered for development in Midland, Kent, Isabella, Clare and Allegan counties.

Following is the summary of the past week's completions in the state:

Allegan County

Heath Township (3n-14w)—M. S. Porter abandoned location of the No. 1 Justin Schievink, NW SE NW Section 9.

Hopkins Township (3n-12w)—Muskegon Development Co. abandoned location on the No. 1 G. Blain, SE SW SE Section 14, as Bell & Marks, Inc., completed the No. 1 O. A. Parmela, SE NE NE Section 22 at a total depth of 1,665 feet. Given acid treatment the well's production was gauged at 107 bbls. in 14 hours.

Martin Township (2n-11w)—Gordon Oil Co. and C. C. Hilliard abandoned the No. 1 Bender, N half NE NW Section 27, getting only a hole full of water after drilling to a total depth of 1,673 feet.

Otsego Township (1n-12w)—American Drilling Co., getting a slight show of oil in the No. 1 John Lovett, SE NW NE Section 31, at a depth of 1,386 feet, ultimately registered a failure, abandoning the attempt after continuing the drilling nearly 300 feet to a total depth of 1,674 feet.

Salem Township (4n-13w)—Michigan Devonian Petroleum Co. got back into the swing of things with an important, productive completion extending easterly the old Salem field. The well, the No. 1 Green, SW SW SE Section 15, completed at a total depth of 1,584 feet, had a good natural flow with output jumped to a potential considerably better than 800 bbls. a day after acid treatment. During the first 24 hours, with the well pinched in all but four hours of that time, production was 790 bbls. of oil. Another fair well and two that are only mediocre were completed in the Salem field. Lentz & Miller, Inc., are getting about 15 bbls. a day from the No. 4 Tillie Newell, NW NE SW Section 16, which was acidized after completion at a depth of 1,819 feet. Completed and acidized after drilling to 1,560 feet, the Mesel & Spielberg No. 1 Grace Hardy, SE NE SW Section 21, was producing at a 75-bbl. daily rate. Effect of a heavy penetration of acid, 2,000 gallons being forced into the rock, production of Petroleum Enterprises No. 1 Dean Byers, NE NW NE Section 22, was boosted to 400 bbls. a day, the well being completed at a depth of 1,574 feet.

Overisel Township (4n-14w)—W. Roy Hogan, jr., abandoned location on the No. 1 George Lampen, NE NE SW Section 23.

Barry County

Irving Township (4n-9w)—A Barry County wildcat test turned out unsuccessful as Redman Oil Co., after drilling a 2,129-foot hole, and finding it dry, abandoned the No. 1 Ella Slynn, NE NE SW Section 23.

Clare County

Freeman Township (18n-6w)—Only two Central Michigan completions were recorded during the week, one being a good well, the No. 3 Flora Coyne, NE SW NE Section 4, controlled by C. L. Maguire, Inc. Its total depth being 3,858½ feet, the well, in the customarily productive Freeman pool, established natural production estimated at better than 700 bbls. a day.

Redding Township (19n-6w)—Offsetting its Freeman find, the Maguire interests checked off a failure as the No. 2 Goldsmith-Wine, NW SW SE Section 34, was completed dry and was abandoned after being drilled 3,896 feet.

Clinton County

Riley Township (6n-3w)—Like the Barry County test, the No. 1 Louis Koeppen, E half SE SE Section 19, a wildcat venture by C. P. McDonald, trustee, also was a failure. The attempt was abandoned with the hole drilled a total depth of 2,961.

Kent County

Walker Township (7n-12w)—Swanson Oil Co., completing an offset well, acidized its No. 1 D. Slykhouse, SW SW SE Section 32, to increase daily production to 350 bbls. of oil. The well's total depth is 1,866 feet.

Wyoming Township (6n-12w)—Gordon Oil Co. got the second completion of the week in the developing Kent County area as the No. 1 Gavin, NE NW NW Section 5, another producing well offset, was completed at a depth of 1,902 feet. After acid treatment the production rated at 800 bbls. daily.

Ogemaw County

Foster Township (24n-1e)—Wildcatting on a state lease failed for Weber Oil Co., which abandoned the No. R-1 State of Michigan, NW NW SW Section 23, after failing to get a promise in 2,957 feet of drilling.

Van Buren County

Bloomingdale Township (1s-14w)—Top producer of the week in Michigan was reported from the growing Bloomingdale field as the M. H. Bauman No. 4 Rogers, SW SW SW Section 8, was completed with a natural flow of 1,000 bbls. a day. The field's four other completions also were good producers. In the SE SE SW Section 8, the No. 4 Ida Melvin, a Fisher-McCall Oil & Gas, Inc., development, production was at the rate of 500 bbls. a day after the well, completed at a depth of 1,204 feet, was treated with 500 gallons of acid. In adjoining Section 9 the Clark & Johnson No. 3 Wiggins Estate, after completion at 1,249 feet, was given acid treatment, bringing daily output up to 300 bbls. The No. 1 T. J. and Anna Leahy, SE NW NW Section 19, an F. Caldwell, Inc., well, was doing 425 bbls. a day after 1,000 gallons of acid was forced into the producing formation as the test was successful at a total depth of 1,215 feet. The H. Brown Cannon, trustee, No. 1 Delbert Brown, NE NE NW Section 24, deeper than most of the Bloomingdale field producers, was rated at 700 bbls. daily after completion at 1,377 feet and treatment with 1,000 gallons of acid.

Bangor Township (2s-16w)—Christ Shrock abandoned as a dry hole at 1,055 feet the No. 1 Church, NW NW NE Section 26, an exploratory test 2½ miles from production, after running into brine.

Columbia Township (1s-15w)—Of the week's four Columbia completions, two failed, one was the next thing to a failure and the other was fairly promising. Sprenger Brothers No. 1 E. W. Love, NW NW SW Section 11, completed and acidized at a depth of 1,185 feet, was producing at the rate of only 5 bbls. a day. The A. J. McColl No. 1 Joseph Cedargreen, E half NW SW Section 14, was dry and abandoned at 1,186 feet. Also abandoned was the DeVreis & Boeve No. 1 Fry, still dry when the test was stopped after 1,210 feet of drilling. Clifford F. Clapsaddle and Lester W. Harris were getting 250 bbls. a day from the No. 1 Ruth DeRocher, NE NW NE Section 24, which was completed and acidized at a total depth of 1,199 feet.

Canadian Fields

Completions and Operations in Northwest and in Ontario

By VICTOR LAURISTON

CHATHAM, Ontario, Apr. 10.—Crude oil and naphtha production from all Alberta fields in February totaled 340,107 bbls. compared with 515,539 bbls. in January. Turner Valley limestone crude declined from 462,758 to 303,861 bbls. naphtha production from 49,296 to 30,388 bbls. and shallow crude from 796 to 625 bbls. Red Coulee light crude was down from 1,206 to 1,092 bbls. Wainwright heavy crude increased from 524 to 1,220 bbls. Heavy crude production from the Dina-Lloydminster area was 324 bbls. against 959 bbls. in January, and Taber production was 2,594 bbls., with none reported for January.

In Turner Valley in February, Royalite Oil Co. was the largest producing organization with 54,504 bbls. of crude and 17,925 bbls. of naphtha. Brown Oil Corp. produced 16,243 bbls.; West Turner Petroleums, 14,321 bbls.; Royal Canadian Oil Co., 13,884 bbls.; Sunset Oils, 13,628 bbls.; Davies Petroleums, 12,722 bbls.; Anglo-Canadian Oil Co., 12,319 bbls.; Commoil, 11,355 bbls., and Frontier Royalties, 10,242 bbls. Among new producers, D. & D. Oils No. 1, Section 9-18-2w5, delivered 7,514 bbls. Home Oil Co. No. 2 Millarville, in North Turner Valley, was shut down to 639 bbls. for the month, its January production of 18,856 bbls. having exceeded its quota.

Increase in Allowables

Effective April 1, aggregate allowables for 70 crude producers in Turner Valley were increased from 10,641 to 17,500 bbls. a day, the new quotas representing approximately 30 per cent of the field potential. Allowables were previously fixed on February 1 at 10,000 bbls., the difference representing new completions in the interval. The upward revision was due to heavier oil and gasoline demand resulting from spring activities, as well as a seasonal increase in motor traffic. With the completion of the new British-American Oil Co. refinery at Calgary early in May a further increase is regarded as likely.

Under the new schedule, Home Oil Co. No. 2 Millarville, North Turner Valley, has the largest allowable, 514 bbls. a day. Other major producers are Royal Canadian No. 2, 484 bbls.; Royalite Oil Co. No. 36, 470 bbls.; Vulcan-Brown Petroleums No. 1, 456 bbls.; Extension Royalties No. 1, 443 bbls.; Sundance Royalties No. 1, 432 bbls.; Anglo-Canadian Oil Co. No. 3, 424 bbls., and Frontier Royalties No. 1, 410 bbls. Among the major producing groups, Anglo-Canadian Oil Co. and affiliates have the largest aggregate crude quota, 3,709 bbls. a day; with Royalite Oil Co. second with 3,339 bbls. and Brown Oil Corp. third with 3,014 bbls. a day. The Royalite crude quota is, of course, supplemented by a substantial naphtha production.

Among the new producers, D. & D. Oils No. 1, LSD 12, Section 9-18-2w5, is stepped up from 138 to 219 bbls. a day; and Royalite Oil Co. No. 37 is allowed 362 bbls.

Field Tests Completed

Immediately preceding the issuing of new quotas, the Alberta Conservation Board carried on a series of new bottom-hole pressure tests throughout the entire field, to determine the effect of the recent restricted flow, following the freer flows permitted last summer and fall. Where last September an average of 4,000 feet of gas was required to lift a barrel of oil, in the recent tests the amount of gas had dropped to 2,526 feet per barrel.

(Continued on Page 95)

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1st NATIONAL

STATEMENT OF CONDITION

At the Close of Business, March 29, 1939

ASSETS

Cash on Hand and Due from Banks	$ 58,693,825.12
United States Securities Owned	24,129,029.65
Stock in Federal Reserve Bank	321,000.00
Other Stocks and Bonds	1,726,449.45
Loans and Discounts	40,983,790.38
Furniture and Fixtures	293,966.70
Banking House	2,345,000.00
Other Real Estate	1,211,584.80
	$130,704,846.30

LIABILITIES

Capital Stock		$ 8,000,000.00
Surplus Fund		2,700,000.00
Undivided Profits, Net		3,479,367.55
Reserved for Taxes, Etc.		195,580.99
Reserved for Dividends		320,000.00
DEPOSITS		
Individual	$75,081,816.57	
Banks and Bankers	33,721,465.87	
U. S. Government	7,206,615.32	
		116,009,897.76
		$130,704,846.30

Includes over $18,000,000.00 in Loans to the Oil Industry

FIRST NATIONAL BANK IN DALLAS MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

WILDCAT OPERATIONS

CALIFORNIA

IMPORTANT WELLS AND NORTHERN CALIFORNIA WILDCATS

Company, well, location and county—	S.T.R.	Depth	Status
Gerard & Thompson, No. 1-B, Santa M. Val, San. B.	27-10-34	4,970	cleaning out
Richfield Oil, No. 1 Tinaquaic, Foxen Can, San. B.	36- 9-32	4,962	sd. sh. drlg.
Arnold, E. C., No. 2 Careaga, Los Alamos, San. Barb.	8- 8-33	6,373	will deepen
General Pet., No. 1 Chamberlin, Los Olivos, San. B.	12- 7-31	3,864	sd. sh. drlg.
United West. Oil, No. 1 Los Olivos, Santa Barbara	16- 7-30	3,552	fish D.P.
Litho Oil, No. 1 R. I. E., Capitan, Santa Barbara	5- 4-30	1,660	sd. sh. drlg.
Oil Group, No. 1 Hyland, Summerland, Santa Barb.	16- 4-26	1,220	sd. sh. drlg.
Merchants Pet., No. 8 Hillside, Sespe, Ventura	1- 4-20	1,805	sd. sh. drlg.
Ivers, H. A., No. 14 Kentuck, Sespe, Ventura	1- 4-20	1,181	O.S. drlg.
Section 20 Oil, No. 21, Sespe, Ventura	20- 5-19	2,547	recmtd. 2,537
Shomy Oil, No. 1 Hill, Bardsdale, Ventura	32- 4-19	608	sd. sh. drlg.
Continental Oil, No. 11 Grubb, San Miguelito, Vent.	24- 3-24	1,360	sd. sh. drlg.
C. C. M. Oil, No. 7-A Hobson, Padre Canyon, Ventura	15- 3-24	3,870	sd. sh. drlg.
C. C. M. Oil, No. 25-B Hobson, Rincon, Ventura	17- 3-24	4,658	O.S. drlg.
Rincon Dev., No. 82-4 State Permit, Rincon, Ventura	7- 3-24	2,078	cmtd. 2,048
Tide Water A. O., No. 40 V.L.W., Ventura Ave., Vent.	25- 3-23	9,248	sd. sh. drlg.
Tide Water A. O., No. 14 McGonigle, Vent. Ave., Vent.	23- 3-23	6,697	hd. sh. drlg.
Tide Water A. O., No. 77 Lloyd, Ventura Ave., Vent.	27- 3-23	9,060	sd. sh. drlg.
Tide Water A. O., No. 123 Lloyd, Ventura Ave., Vent.	27- 3-23	7,470	sd. sh. drlg.
Tide Water A. O., No. 124 Lloyd, Ventura Ave., Vent.	23- 3-23	5,845	sd. sh. drlg.
Tide Water A. O., No. 134 Lloyd, Ventura Ave., Vent.	27- 3-23	8,339	redrlg. 8,280
Tide Water A. O., No. 8 Hartman, Ventura Ave., Vent.	22- 3-23	6,860	sd. sh. drlg.
Shell Oil, No. 98 Taylor, Ventura Ave., Ventura	21- 3-23	7,498	sd. sh. drlg.
Shell Oil, No. 33 Edison, Ventura Ave., Ventura	28- 3-23	7,460	sd. sh. drlg.
Brit. Amer. Oil, No. 7 Bolsa, Ventura Ave., Ventura	22- 3-23	7,899	fish reamer
Alliance Pet., No. 3 Hisey, Ventura Ave., Ventura	21- 3-23	7,750	sd. sh. drlg.
Lloyd Corp., No. 2 Dabney, Ventura Ave., Ventura	23- 3-23	9,650	O.S. drlg.
Luxton, W. L., No. 1 Herzog, Devil's Den, Kern	27-25-18	612	idle
Cal. Expl., No. 2 Occidental, Lost Hills, Kern	24-26-20	5,625	P.D. 5,538
Belridge Oil, No. 36-39, North Belridge, Kern	36-27-20	7,480	br. sh. drlg.
Belridge Oil, No. 28-16, North Belridge, Kern	28-27-20	5,296	sd. sh. drlg.
Tide Water A. O., No. 23-3, North Belridge, Kern	22-27-20	8,110	hd. sd. drlg.
Richfield Oil, No. 3 Belridge, North Belridge, Kern	22-27-20	7,596	redrlg. 6,098
Honolulu Cons'd., No. 63 Michelssen, Belridge, Kern	14-28-20	1,667	sd. sh. drlg.
Trico O. & G., No. 1 T. & G., Delano Gas Field, Kern	2-25-23	2,434	gas zone
Atlas Pet., No. 1 Moore, Delano, Kern	7-25-25	176	sd. sh. drlg.
Dilamar Oil, No. 3 Quinn, Jasmin, Kern	15-25-27	2,823	gr. sd. drlg.
Milburn, J. L, No 1 Trust, South Kern River, Kern	13-29-28	1,667	dry; abd.
Crestmont Oil, No. 1 Coffee, Round Mountain, Kern	8-28-29	1,502	P.B. 1,330
Combs Bros., No. 2 Kern, Kern River, Kern	28-28-28	265	sd. sh. drlg.
D. B. K., No. 2 Kern, Kern River, Kern	34-28-28	440	rig to pump
D. B. K., No. 3 Kern, Kern River, Kern	34-28-28	130	sd. sh. drlg.
Italo Pet., No. 1 Judkins, Kern River, Kern	19-28-28	1,286	sd. sh. drlg.
Triad Oil, No. 1 A.H.S., Kern River, Kern	19-28-28	1,199	rig to pump
Ring Oil, No. 4 Rogers-Jones, Mount Poso, Kern	29-26-28	1,773	O.S. drlg.
Ring Oil, No. 6 Shapiro, Mount Poso, Kern	32-26-28	1,725	pump 485 b.d.
Superior Oil, No. 1 Jewett, Arvin, Kern	16-31-29	6,250	O.S. drlg.
Texas Co., No. 1 Jewett, Arvin, Kern	16-31-29	1,118	sd. sh. drlg.
Western Gulf Oil, No. 1, KCL, Fruitvale, Kern	14-28-27	3,825	dry; abd.
Pacific Southwest Oil, No. 1 Dillon, Fruitvale, Kern	27-29-27	3,915	idle
Standard Oil, No. 2 Mushrush, Wasco, Kern	7-27-24	13,124	D.P. stuck
Standard Oil, No. 8-2-B, KCL, Wasco, Kern	17-27-24	11,850	sd. sh. drlg.
Union Oil, No. 36-1, KCL, Shafter, Kern	36-27-24	11,840	sd. sh. drlg.
Cal. Expl., No. 1 Dougherty-Salisbury, Butw'w, Kern	7-29-24	12,250	hd. sd. drlg.
General Pet., No. 2 Van Ness, Rio Bravo, Kern	2-29-25	5,476	D.P. stuck
General Pet., No. 1 Caldwell, Rio Bravo, Kern	35-28-25	11,395	O.S. drlg.
Union Oil, No. 8-34, KCL, Rio Bravo, Kern	34-28-25	1,517	cmtd. 1,400
Superior Oil, No. 1 Moodie, Rio Bravo, Kern	26-28-25	4,893	sd. sh. drlg.
Standard Oil, No. 2 Fleishauer, Greeley, Kern	20-29-26	11,575	scrape hole
Standard Oil, No. 11-16, KCL, Greeley, Kern	20-29-26	11,100	hd. sd. drlg.
Standard Oil, No. 11-17, KCL, Greeley, Kern	18-29-26	10,602	hd. sd. drlg.
Standard Oil, No. 12-6, KCL, Greeley, Kern	30-29-26	9,830	hd. sh. drlg.
Standard Oil, No. 1 Elrich, Greeley, Kern	20-29-26	12,976	cleaning out
Superior Oil, No. 12, KCL, Greeley, Kern	3-30-26	13,131	dry; abd.
Shell Oil, No. 2-28-B, KCL, Ten Section, Kern	28-30-26	3,998	sd. sh. drlg.
Shell Oil, No. 23-14-A, KCL, Canal, Kern	14-30-25	8,338	cmtd. 8,150
Shell Oil, No. 87-4-B, KCL, Canal, Kern	4-30-25	13,240	sd. sh. drlg.
Ohio Oil, No. 11-E, KCL, Canal, Kern	14-30-25	7,493	sd. sh. drlg.
Richfield Oil, No. 52-32-A, KCL, Tupman, Kern	32-30-25	8,793	O.S. drlg.
Union Oil, No. 1-11, Coles Levee, Kern	11-31-25	9,715	flow 635 b.d.
Tide Water A. O., No. 61, KCL, Coles Levee, Kern	14-31-25	2,984	sd. sh. drlg.
Standard Oil, No. 20-1, KCL, Coles Levee, Kern	9-31-25	8,600	coring ahead
Ohio Oil, No. 2-F, KCL, Coles Levee, Kern	10-31-25	9,653	will deepen
Premier-Padran Oil, No. 1 Sunset, Mid.-Sun., Kern	25-32-23	1,737	pump water
Vista Grande Oil, No. 1 Schultz, Midway-Sunset, Kern	36-32-23	3,630	bailing
Van Fleet & Durkee, No. 3 Hoist, Midway-Sun., Kern	36-32-23	169	sd. sh. drlg.
Fried, Julius, No. 1 Fried, Midway-Sunset, Kern	34-32-24	5,035	recmtd. 4,400
National Oil, No. 32 Midway, Midway-Sunset, Kern	35-32-23	2,224	O.S. drlg.
Standard Oil, No. 7-29 Western, McKittrick, Kern	7-30-22	2,325	rig to pump
Gates, F. E., No. 2 Laymance, McKittrick, Kern	20-30-22	530	sd. sh. drlg.
Westco Pet., No. 1 West, McKittrick, Kern	34-30-22	6,496	P.B. 5,340
Richfield Oil, No. 1 KCL, Wheeler Ridge, Kern	28-11-20	8,765	will deepen
Shell Oil, No. 8-32-1-A, KCL, San Emidio, Kern	32-11-22	2,281	sd. sh. drlg.
Petrol Corp., No. 33-5 Reserve, Tejon Ranch, Kern	33-11-19	8,946	idle
Foreign Oil, No. 6 Annex, West Coalinga, Fresno	6-21-15	2,540	pump water
Stuart Oil, No. 1 Hill, West Coalinga, Fresno	12-21-14	1,468	sd. sh. drlg.
Tyler & Cornwell, No. 4 Tyler, West Coalinga, Fresno	14-20-14	302	sd. sh. drlg.
Raco Oil, No. 1 Smith, West Coalinga, Fresno	3-20-14	270	sd. sh. drlg.
Rylatt, Harry, No. 3 Kipling, West Coalinga, Fresno	26-20-14	1,230	sd. sh. drlg.
Amerada Pet., No. 7-17 S.P.L., North Coalinga, Fresno	17-19-16	8,085	O.S. drlg.
Petseahon, No. 31-7-F, Southeast Coalinga, Fresno	7-20-16	5,550	hd. sh. drlg.
Petseahon, No. 62-7-F, Southeast Coalinga, Fresno	7-20-16	3,954	sd. sh drlg.
Petseahon, No. 3-18-F, Southeast Coalinga, Fresno	18-20-16	2,348	sd. sh. drlg.
Texas Co., No. 1 fee, Southeast Coalinga, Fresno	6-20-16	6,470	sd. sh. drlg.
Standard Oil, No. 71-13-C fee, Southeast Coal., Fresno	13-20-15	6,961	flow 6,000 b.d.
Standard Oil, No. 73-13-C fee, Southeast Coal., Fresno	13-20-15	5,999	br. sh. drlg.
Superior Oil, No. 3 fee, Southeast Coalinga, Fresno	7-20-16	7,990	O.S. drlg.
Superior Oil, No. 4 fee, Southeast Coalinga, Fresno	7-20-16	8,000	flow 2,700 b.d.
K. N. D. A., No. 54-24-H, Kettleman North, Fresno	24-21-16	10,500	hd. sh. drlg.
K. N. D. A., No. 47-16-Q, Kettleman North, Kings	16-22-18	7,498	br. sh. drlg.
K. N. D. A., No. 4-18-Q, Kettleman North, Kings	18-22-18	5,470	br. sh. drlg.
K. N. D. A., No. 36-18-Q, Kettleman North, Kings	18-22-18	7,739	cmtd. 7,159
K. N. D. A., No. 6-22-Q, Kettleman North, Kings	22-22-18	6,695	sd. sh. drlg.
K. N. D. A., No. 78-22-Q, Kettleman North, Kings	22-22-18	7,960	flow 1,791 b.d.
Standard Oil, No. 56-1-P, Kettleman North, Kings	1-22-17	8,228	testing
Standard Oil, No. 61-11-P, Kettleman North, Kings	11-22-17	7,230	sd. sh. drlg.
Standard Oil, No. 76-7-Q, Kettleman North, Kings	7-22-18	8,300	completing
Standard Oil, No. 62-17-Q, Kettleman North, Kings	17-22-18	4,940	sd. sh. drlg.
Standard Oil, No. 74-17-Q, Kettleman North, Kings	17-22-18	6,861	br. sh. drlg.
Standard Oil, No. 81-19-Q, Kettleman North, Kings	19-22-18	5,990	hd. sh. drlg.
Standard Oil, No. 41-21-Q, Kettleman North, Kings	21-22-18	5,982	sd. sh. drlg.
Standard Oil, No. 52-17-Q, Kettleman North, Kings	21-22-18	149	sd. sh. drlg.
Standard Oil, No. 83-21-Q, Kettleman North, Kings	21-22-18	6,453	br. sh. drlg.
Cal. Pet. Prod., No. 1 Irons, Cuyama, San Luis Obispo	19-10-24	1,970	sd. sh. drlg.
Newton, S. M., No. 1 Stafford, Panorama, San L. Obis.	18-31-21	1,196	sd. sh. drlg.
Epco, Inc., No. 1 Ajax, Union, San Luis Obispo	27-26-13	4,750	br. sh. drlg.
Texas Co., No. 1 Arroyo Seco, Greenfield, Monterey	11-19- 5	2,425	sd. sh. drlg.

IMPORTANT WELLS AND SOUTHERN CALIFORNIA WILDCATS

Company, well, location and county—	S.T.R.	Depth	Status
A. B. C. Oil, No. 1 Angelich, Torrance, Los Angeles	23- 4-14	5,200	P.B. 5,170
Cinco Oil, No. 1 Woodruff, Torrance, Los Angeles	23- 4-14	4,580	sd. sh. drlg.
Campeet Oil, No. 17-A Kleinmyer, Torrance, Los A.	23- 4-14	5,583	idle
D. & B. Oil, No. 4 Lomita, Torrance, Los Angeles	23- 4-14	5,187	sd. sh. drlg.
Deep Hole Drlg., No. 2 Kovell, Torrance, Los Angeles	23- 4-14	5,217	P.B. 5,130
Elliott, D. W., No. 9 Kettler, Torrance, Los Angeles	23- 4-14	5,175	flow 265 b.d.
Garner-Johnson Oil, No. 7 Bush, Torrance, Los Ang.	23- 4-14	3,800	will deepen
Greenspun System, No. 1 Miller, Torrance, Los Ang.	23- 4-14	3,280	sd. sh. drlg.
Kildumac Oil, No. 1 Mitchell, Torrance, Los Angeles	23- 4-14	4,896	sd. sh. drlg.
King Pet., No. 1 Port, Torrance, Los Angeles	23- 4-14	4,830	sd. sh. drlg.
Lebow-McNee Oil, No. 2-B Kettler, Torrance, Los A.	23- 4-14	2,831	sd. sh. drlg.
Lone Star Drlg., No. 1 Pestor, Torrance, Los Angeles	23- 4-14	5,163	flow 160 b.d.
Main Oil, No. 1 Lomita, Torrance, Los Angeles	23- 4-14	5,135	O.S. drlg.
McCaslin, W. E., No. 1 Robertson, Torrance, Los A.	23- 4-14	5,167	O.S. drlg.
Mooschekian Bros., No. 1 Schultz, Torrance, Los Ang.	23- 4-14	3,991	sd. sh. drlg.
Pacific West. Oil, No. 17 Marble, Torrance, Los Ang.	15- 4-14	3,780	redrlg. 3,570

KEY TO ABBREVIATIONS USED IN DRILLING REPORTS

Abd., abandoned.
Acd., acidized.
B.O., barrels of oil.
B.P.D., barrels per day.
B.D., barrels daily.
B.P., back pressure.
B.R., building rig.
B. ck., bottom choke.
Br. sh., brown shale.
B.S., basic sediment.
C.&P., cellar and pits.
Cd. or Crd. cored.
C.D., correct depth.
Cg., coring.
Cmtd., cemented.
C.O., cleaning out.
Comp., completed.
Compr., compressor.
C.P., casing pressure, also cement through perforations.
Csg., casing.
D.D., drilling (or drilled) deeper.
Drlg. or Drg., drilling.
Drk. or "Dk., derrick.
D.S., drill stem.
D.S.T., drill stem test.
D.&A., dry and abandoned.
Fsg., fishing.
Gbo., gumbo.
G.I., gas injection.
Gr., gravity.
Gr. sd., gray sand.
Grn. sh., green shale.
Hd. sd., hard sand.
H.F.W., hole full of water.
I.P., initial production.
L., lime.
L.D.D., later drilled deeper.
Lnr., liner.
Loc., location.
M.I.M., moving in material.
M.I.R., moving in rig.
M.I.R.T., moving in rotary tools.
M.O.T., milling on tools.
O.I.H., oil in hole.
O.S., oil sand.
O.T.D., old total depth.
O.W.D.D., owell drilling deeper.
O.W.P.B., old well plugging back.
P.B., plugging back.
P.B.P., pulling or pulled big pipe.
P.L., pipe line.
P.L.O., pipe line oil.
Pmpg., pumping.
P.O.P., putting on pump.
P.P., pulled pipe.
Rd. sd., red sand.
Rd. sh., red shale.
Recmt., recemented.
Recvd., recovered.
Rmg., reaming.
Redrlg., redrilling.
Rng., running.
R.O.G., rig on ground.
R.P., rock pressure.
R.U., rigging up.
R.U.R., rigging up rotary.
R.U.S.T., rigging up standard tools.
R.&T., rods and tubing.
S. or Sd., sand.
S.D., shut down.
Sdy. sh., sandy shale.
Sdtrk. or St., sidetracking.
S.D.P.L., shut down for pipe line.
S.D.O., or S.D.W.O., shut down awaiting orders.
S.G., show gas.
Sh.&L., shale and lime.
S.I., shut in.
S.I.P., shut in, prorated.
S.L.M., steel line measurement.
S.O., show oil.
S.O.G.&W., show of oil, gas and water.
Spdg. or Spd., spudding.
S.R., straightreaming.
Stdg., standardizing (also standing)
S.W., salt water.
Swbg., swabbing.
T.A., temporarily abandoned.
Tbg., tubing.
T.D., total depth.
T. ck., top choke.
T.P., tubing pressure.
Tr., tract.
Tstd., tested.
U.R., underreaming.
W.I.H., water in hole.
W.O., workover.
W.O.C., or W.O.C.S., waiting on cement to set.
W.O.O., waiting for orders.
W.P., working pressure.
W.S.O., water shutoff.
W.S.S.O.K., water shutoff O.K.
W.S.R. or W.O.S.R., awaiting standard rig.
Wtr., water.

Packard Oil, No. 1 Pollard, Torrance, Los Angeles	23-	4-14	5,052	O.S. drlg.
Peters Roy., No. 1 Bass, Torrance, Los Angeles	23-	4-14	5,166	O.S. drlg.
Plymouth Oil, No. 3 Lomita, Torrance, Los Angeles	23-	4-14	2,247	sd. sh. drlg.
Rilling & Co., No. 1 H. & H., Torrance, Los Angeles	23-	4-14	4,760	sd. sh. drlg.
Riviera Pet., No. 1 B. & G., Torrance, Los Angeles	23-	4-14	4,871	sd. sh. drlg.
Standard Oil, No. 1 -11 Marble, Torrance, Los Ang.	22-	4-14	3,825	rigged up
Shadle Pet., No. 1 Kettler, Torrance, Los Angeles	23-	4-14	4,290	sd. sh. drlg.
Symbol Oil, No. 3 Lomita, Torrance, Los Angeles	23-	4-14	5,165	O.S. drlg.
Sunset Oil, No. 1 LaSalle, Torrance, Los Angeles	23-	4-14	5,202	P.B. 5,157
Vesta Pet., No. 2 Bruhn, Torrance, Los Angeles	23-	4-14	2,964	sd. sh. drlg.
World Pet., No. 2 Flint, Torrance, Los Angeles	23-	4-14	3,700	will deepen
Wilson, Ray, No. 3 Lomita, Torrance, Los Angeles	23-	4-14	4,179	cleaning out
Whit. S. F. S. Synd., No. 1 Mertz, Torrance, Los Ang.	23-	4-14	5,166	flow 280 b.d.
C. C. M. O., No. 49 Lomita, Torrance, Los Angeles	15-	4-14	3,735	redrlg. 3,660
C. C. M. O., No. 12 Kettler, Torrance, Los Angeles	14-	4-14	3,825	rigged up
General Pet., No. 14 Poggi, Harbor City, Los Angeles	30-	4-13	5,160	sd. sh. drlg.
Texas Co., No. 5 Oakley, Harbor City, Los Angeles	30-	4-13	3,981	sd. sh. drlg.
Union Oil, No. 67 Callender, Dominguez, Los Angeles	33-	3-13	6,080	sd. sh. drlg.
Union Oil, No. 11 Carson, Dominguez, Los Angeles	33-	3-13	7,780	sd. sh. drlg.
Union Oil, No. 49 Hellman, Dominguez, Los Angeles	33-	3-13	9,474	P.B. 6,777
Shell Oil, No. 27-A Reyes, Dominguez, Los Angeles	33-	3-13	4,075	redrlg. 3,698
Metcalfe Oil, No. 1 Bradford, Rosecrans, Los Angeles	20-	3-13	7,702	swabbing
Union Oil, No. 31 Rosecrans, Rosecrans, Los Angeles	19-	3-13	7,718	completing
Universal Cons'd., No. 15 Trust, Rosecrans, Los Ang.	18-	3-13	4,500	sd. sh. drlg.
Royalty Ser., No. 3 Gordon, Rosecrans, Los Angeles	19-	3-13	7,835	redrlg. 6,065
Bankline Oil, No. 1 Kirby, Rosecrans, Los Angeles	19-	3-13	7,653	fish D.P.
Basin Oil, No. 4 Club, Potrero, Los Angeles	34-	2-14	5,468	sd. sh. drlg.
Beloil Corp., No. 1 Castlebury, Potrero, Los Angeles	34-	2-14	5,450	will redrl.
Standard Oil, No. 1 Ward, Aliso Canyon, Los Angeles	27-	3-16	4,740	sd. sh. drlg.
Tide Water A. O., No. 2 Porter, Aliso Canyon, Los A.	27-	3-16	5,200	O.S. drlg.
Union Oil, No. 1-27 Orcutt, Aliso Canyon, Los Angeles	27-	3-16	4,450	sd. sh. drlg.
Mangrum & Page, No. 1 Lintz, Newhall, Los Angeles	4-	3-15	240	sd. sh. drlg.
General Pet., No. 21 Harbor, Wilmington, Los Ang.	2-	5-13	1,944	sd. sh. drlg.
General Pet., No. 35 Harbor, Wilmington, Los Ang.	2-	5-13	4,050	flow 1,750 b.d.
General Pet., No. 15 S.P., Wilmington, Los Angeles	2-	5-13	1,932	sd. sh. drlg.
General Pet., No. 2 P.E., Wilmington, Los Angeles	2-	5-13	4,120	flow 946 b.d.
Allied Pet., No. 31 Harbor, Wilmington, Los Angeles	35-	4-13	3,080	O.S. drlg.
Dunlap Oil, No. 3-D-U.P., Wilmington, Los Angeles	3-	5-13	4,020	flow 580 b.d.
F. A. Pet., No. 1 Franco, Wilmington, Los Angeles	29-	4-13	3,725	redrlg. 3,710
Getty, G. F., No. 8-W, Wilmington, Los Angeles	33-	4-13	3,590	rig to pump
Padreson Oil, No. 55-2-D. Harbor, Wilmington, L. A.	35-	4-13	2,680	sd. sh. drlg.
Richfield Oil, No. 30 P.D., Wilmington, Los Angeles	2-	5-13	259	idle
Signal O. & G., No. 1 Allen, Wilmington, Los Angeles	2-	5-13	4,330	sd. sh. drlg.
Signal O. & G., No. 1-D, L.B.-U.P., Wilmington, L. A.	3-	5-13	4,194	flow 3,500 b.d.
Signal O. & G., No. 2-D, L.B.-U.P., Wilmington, L. A.	3-	5-13	4,063	flow 3,500 b.d.
Signal O. & G., No. 2 L.B.-P.D., Wilmington, L. A.	2-	5-13	4,181	sd. sh. drlg.
Union Pacific R. R., No. 105, Wilmington, Los Ang.	34-	4-13	2,555	sd. sh. drlg.
Union Pacific R. R., No. 108, Wilmington, Los Ang.	4-	5-13	4,058	O.S. drlg.
Union Pacific R. R., No. 14-E, Wilmington, Los Ang.	34-	4-13	3,125	O.S. drlg.
Universal Cons'd., No. 9 Newport, Wilmington, L. A.	2-	5-13	3,085	flow 300 b.d.
Vulcan Oil, No. 469-1 Gilmore, Wilmington, Los A.	33-	4-13	5,575	pump 135 b.d.
Ridge Oil, No. 1 Club, Montebello, Los Angeles	3-	2-12	4,497	sd. sh. drlg.
St. Helens Pet., No. 30 Monterey, Montebello, Los A.	2-	2-12	7,275	P.B. 6,792
St. Helens Pet., No. 2 Eggleston, Montebello, L. A.	2-	2-12	6,460	sd. sh. drlg.
St. Helens Pet., No. 4 Mulholland, Montebello, L. A.	2-	2-12	7,175	flow 1,896 b.d.
Standard Oil, No. 2 Kaufman, Montebello, L. A.	2-	2-12	7,255	recmtd. 6,950
Standard Oil, No. 2 Harvey, Montebello, Los Angeles	2-	2-12	7,200	flow 525 b.d.
Standard Oil, No. 4 Harvey, Montebello, Los Angeles	2-	2-12	6,673	milling 6,325
Standard Oil, No. 5 Whitehead, Montebello, Los A.	3-	2-12	4,983	sd. sh. drlg.
Standard Oil, No. 6 Whitehead, Montebello, Los A.	3-	2-12	2,097	sd. sh. drlg.
Union Oil, No. 30 La Merced, Montebello, Los Angeles	1-	2-12	8,468	sd. sh. drlg.
Stanley Oil, No. 1 Montebello, Montebello, Los Ang.	2-	2-12	7,010	fish D.P.
Mont. Reservoir Oil, No. 2 Water, Montebello, Los A.	2-	2-12	3,040	sd. sh. drlg.
Texas Co., No. 5 Mulholland, Montebello, Los Angeles	2-	2-12	7,202	O.S. drlg.
Traders Oil, No. 1 Extension, Montebello, Los Ang.	2-	2-12	5,150	sd. sh. drlg.
Graham & Loftus, No. 1 Coffman, Montebello, Los A.	2-	2-12	7,008	sd. sh. drlg.
Vulcan Oil, No. 1 Calkins, Montebello, Los Angeles	11-	2-12	6,040	sd. sh. drlg.
Wood-Callahan Oil, No. 1 Harris, Montebello, Los A.	2-	2-12	6,460	sd. sh. drlg.
Bush Oil, No. 1 Olds, Montebello, Los Angeles	3-	2-12	4,562	sd. sh. drlg.
Partridge, C. W., No. 1 Hillside, Whittier, Los Ang.	22-	2-11	1,508	sd. sh. drlg.
H. & C. Oil Co., No. 1 Joyce, Whittier, Los Angeles	22-	2-11	3,610	sd. sh. drlg.
Shell Oil, No. 1-A Stern, Yorba Linda, Orange	23-	3- 9	978	sd. sh. drlg.
Texas Co., No. 1-13-A Smith, Anaheim, Orange	8-	4-10	8,840	sd. sh. drlg.
Richfield Oil, No. 1 Richville, North Long Beach, O.	17-	4-12	2,594	sd. sh. drlg.
Standard Oil, No. 68 Emery, West Coyote, Orange	24-	3-11	5,250	sd. sh. drlg.
Southwest Expl., No. 11 State, Huntington Beach, O.	4-	6-11	4,160	sd. sh. drlg.
Southwest Expl., No. 15 State, Huntington Beach, O.	10-	6-11	2,381	sd. sh. drlg.
Dragon Oil, No. 1 Jauman, Huntington Beach, Orange	36-	5-11	4,625	pump water
Texas Co., No. 10 Brown, Huntington Beach, Orange	11-	6-11	3,440	cleaning out
Patos Drlg., No. 1 Graham, Sunset Beach, Orange	21-	5-11	5,950	sd. sh. drlg.
Union Oil, No. 1 Nieto, Seal Beach, Orange	12-	5-12	2,996	sd. sh. drlg.

KANSAS

Week Ending April 8 (Descriptions are East unless marked otherwise)

Barber County

Barbara Oil Co. No. 1 Wilson, C SE Sec. 17-33-13. Arb. 5,180-89 ft.; S. W.; to P.B.

Barton County

B. B. & M. No. 1 Dupont, SE SE NE Sec. 21-19-11w. Drlg. 151 ft.

Central Pet. and Vernon O. & G. No. 1 Miller, SE SW SE Sec. 17-16-13w. Lns. 3,184 ft.; Arb. 3,418-25 ft., T.D.; drlg. plug; 1,800 ft. O.I.H.

Crown Pet. No. 1 Koch, NE NE NE Sec. 23-20-12w. Drlg. 189 ft.

R. E. Day et al No. 1 Feltes, SE SE NE Sec. 14-16-12w. O.W.D.D.; U.R. 2,460 ft.

Gulf Oil Corp. No. 1 Dolecheck, CNL NE SW Sec. 24-16-12w. T.D. 3,400 ft.; rng. csg.

Long & Johnson No. 1 Eveleigh, SW SW NE Sec. 3-18-14w. Lans. 3,100 ft.; Arb. 3,338 ft.; T.D. 3,371 ft.; P. 2 B. O.P.H.

Paul Martin No. 1-A Feltes, NW SW SE Sec. 8-16-12w. T.D. 2,900 ft.; acd. and F. 336 B.O. in 3 hrs.; 7,000,000 cu. ft. gas.

I. W. Murfin No. 1 Birzer, NE SW Sec. 21-19-11w. Pay 3,130 ft. and 3,152-54 ft.; P. 200 B.O. and wtr. in 24 hrs.; U.R. 7-in.

Transwestern Oil No. 1 Ney, SW SW SE Sec. 8-16-11w. Drlg. 1,570 ft.

York State Oil Co. No. 1 Marchand, CEL NE NE Sec. 24-20-12w. Arb. 3,308 ft.; T.D. 3,311 ft.; P. 20 B.O.P.H.; cd. 3,-318-20 ft., T.D.; inc. oil.

Butler County

C. L. Carlock et al No. 1 Hartenbower, NW NW NW Sec. 16-29-6. Drlg. 2,-060 ft.

Simpson Oil Co. No. 1 Evans, CSL SW Sec. 21-28-7. Drlg. 942 ft.

Cowley County

Lloyd, Frost & Study No. 1 Jones, CEL W½ E½ Sec. 2-31-3. Arb. 3,348-57 ft., T.D.; D.&A.

Henry Gralapp et al No. 1-A Clark, NW NW NE Sec. 11-31-3e. T.D. 3,248 ft.; P.B. 3,000 ft.; drlg. by whipstock.

Dickinson County

Franks et al No. 1 Huffman, NW NW SW Sec. 11-13-1. S.D. 2,368 ft.

Ellis County

Fred Smith No. 1 Werth, SW SW SE Sec. 33-15-18w. Rotary rig.

Graham County

Continental Oil Co. No. 1 Putnam Inv Co., CWL SW Sec. 23-9-21w. Simp. 3,775 ft.; Arb 3,794 ft.; R.U.S.T. 3,-799 ft.

Leavenworth County

John Hardaway No. 1 Scheller, SW SE SW Sec. 30-10-22. S.D. 345 ft.

Marion County

Johnson et al No. 1-A Miltz, SW SW SW Sec. 24-17-4. T.D. 2,485 ft.; S.O. 2,362 ft. and 2,390-2,400 ft., T.D.; P. 5 B.O. P.D.; comp.

Mead County

Pacific Midwest Oil No. 1 Rexford, NE SE SW Sec. 8-30-29w. S.D. 1,435 ft.

Ness County

Oriental Oil Co. No. 1 Beardslee, NE NE NE Sec. 21-18-25w. Rotary rig.

Osage County

J. M. Edwards No. 1 Detrick (O.W.D.D.), C NW SE Sec. 21-14-15. O.T.D. 1,200 ft.; U.R. 8-in. csg.

Ottawa County

Babcock Oil No. 1 Copeman, NW NW Sec. 18-10-2w. Miss. 2,835 ft.; H.F.W. 3,302-10 ft.; S.D. for csg. 3,480 ft.

Pratt County

Champlin Ref. Co. No. 1 Elliott, SW NE Sec. 26-27-14w. Fsg. 4,857 ft.

Rice County

Gulf Oil No. 1 Barngrover, CWL SW SW Sec. 30-19-9w. Lans. 2,943 ft.; S.O. 3,018-20 ft.; drlg. 3,230 ft.

McPherson Drlg. Co. No. 1 Cramm, SE SE SW Sec. 15-19-9w. Drlg.

Phillips Pet. Co. No. 1 Proffitt, CEL NE NE Sec. 8-20-9w. Arb. 3,244-45 ft.; R. U.S.T.

W. E. Rennie No. 1 Williams, C S½ SE SW Sec. 27-21-9w. T.D. 3,469 ft.; 150 ft. O.I.H.; B. 1½ B.O.P.H. for 24 hrs.; D.&A.

Spurrier & Bruce No. 1 Cary, NE NW NW Sec. 30-18-8w. O.W.D.D.; O.T.D. 1,530 ft.; S.D. 1,680 ft.

Russell County

Phil-Han Oil Co. No. 1 Hill, SE SW SW Sec. 16-14-14w. Drlg. 2,075 ft.

Skelly Oil Co. No. 1 Carter, CSL SW NE Sec. 33-14-13w. 1st pay 2,847 ft.; 2nd pay 2,861 ft.; P. 44 B.O. in 1 hr.

Saline County

Central States Oil Co. No. 1 Crawford, NW SW NE Sec. 26-13-3w. S.D. 1,125 ft.

Sedgwick County

C. L. Carlock No. 1 Evans, SW SW SE Sec. 6-25-2. Drlg. 1,740 ft.

Century Pet. Co. No. 1 Wilke, SW SE SW Sec. 1-29-2. S.D. 800 ft.

Shawnee County

W. M. McKnab No. 1 Fritz, SW SE NW Sec. 4-12-14. Miss. 1,901 ft.; H.F.W. 1,-960 ft.; S.D. 2,160 ft.

W. M. McKnab et al No. 1 Spurgeon, SE SW SE Sec. 28-10-15. M.I.M.

Stafford County

Lauck & Moncrief No. 1 Connaughley, SW SW SW Sec. 18-24-13w. Drlg. 798 ft.

E. H. Moore No. 1 Secrest, C S½ SE NW Sec. 21-25-11w. Drlg. 3,450 ft.

Wabaunsee County

Scheu & Tague et al No. 1 Ave, NW SW NW Sec. 10-12-8. C.O. 892 ft.

Woodson County

Roby et al No. 1 Meairs, SW SW NW Sec. 21-25-14. C.O. 400 ft.

M. J. Trott No. 1 Abbott, NW NE NE Sec. 21-25-14e. Drlg. 1,325 ft.

NEBRASKA

Cass County

Golden Rod Oil Co. No. 1 Sparer, SE SE SE Sec. 8-11-13e. R.U. 200 ft.

Pawnee County

Blazer & McClure et al No. 1 Allen, NW NE SW Sec. 16-1n-10e. Bart. sd. 40 ft.; Miss. L. 149 ft.; Arb. 789 ft.; T.D. 801 ft.; lost hole and shot off csg.; P.B. to 450 ft.; 100 gal. acd. and 1,000 gal. acd.; D.&A.

Richardson County

H. C. Stephens and E. Uhri No. 1 Harlow, C SE NE Sec. 32-1n-13e. O.W.D. D.; S.D. 780 ft.

Hitchcock County

C. L. Price No. 1 Carter, SE NE SW Sec. 35-2n-32w. Est. 2 B.O.P.D. between 3,800 ft. and 4,200 ft.

MISSOURI

Clay County

Eastern Drlg. Co. No. 1 Williams, NW NW NE Sec. 28-53-32w. Drlg.

Frank Hopper et al No. 1 Black, NW NW NW Sec. 36-52-32w. Drlg. 217 ft.

De Kalb County

Geo. W. Moore No. 1 McQuarter, NE SW SW Sec. 11-57n-31w (wildcat). Spd.

Holt County

J. H. Everitt et al No. 1 Spring, SW SW SE Sec. 30-62-38w. S.G. 500 ft.; drlg. 1,794 ft.

Markham et al No. 1 Gaffney, SW SE SW Sec. 24-63-40w. M.I.M.

Mercer County

Geo. W. Moore No. 1 Castell, NE NE NE Sec. 32-65-24w. Loc.

Shelby County

Chas. Delfeld No. 1 Turner, C NW NW Sec. 27-59n-9w (wildcat). Drlg.

Sullivan County

H. V. Elwell No. 1 Taylor, CEL NW Sec. 12-62-21w. Rig.

OKLAHOMA

Week Ending April 8

NORTHERN OKLAHOMA

Atoka County

Giblett No. 1 Rich, SE SE SW Sec. 2-1-12. S.D. 725 ft.

Beckham County

H. C. McLaughlin et al No. 1 Durham, C SW Sec. 36-8-24w. S.G. 1,240-57 ft.; drlg. 1,257 ft.

Cleveland County

Nels-Burrton No. 1 Hirsch, NW NW NE Sec. 17-9-2w. O.W.P.B.; O.T.D. 7,692 ft.; T.D. 7,695 ft.; swbg.

Comanche County

Ker-Lyn Oil Co. No. 1 Laging, C NE SW Sec. 30-4-9w. Cd. 6,480-6,500 ft.; rec. sh.&sd.; T.D. 6,500 ft.; S.D.O.

Mid Night Oil No. 1 Howe, NW NW NE Sec. 30-2-13w. O.W.D.D.; O.T.D. 703 ft.; T.D. 773 ft.; S.D.

Ed Parsons No. 1 Stephens, C NW SW Sec. 29-4-9w. Drlg. 314 ft.

Creek County

Burke-Greis No. 1 Vanderslice, NE NE SE Sec. 30-14-7. S.D.O. 2,284 ft.

Ellis County

Enterprize Drlg. Co. No. 1 Wahl, SE NW NW Sec. 1-19-25w. T.D. 305 ft.; S.D.

Garfield County

Continental Oil Co. No. 1 Luedtman, C SW SE Sec. 2-21-4w. Drlg. 3,872 ft.

Hughes Drlg. Co. No. 1 Misener, C NE NW Sec. 10-20-4w. 2nd Wlx. 5,915 ft.; F. 215 B.O. by heads while drlg. to 5,944 ft., T.D.; rng. tbg.

Garvin County

Ker-Lyn Oil Co. No. 1 Butterly, NE NE SE Sec. 22-1-1. O.W.D.D.; O.T.D. 3,-205 ft.; drlg. 3,305 ft.

Pure Oil No. 1 Derdeyn, NE NW SE Sec. 19-3-1. Rec. S.W. at 3,739 ft.; 4,088 ft. D.&A.

Grady County

Carter Oil Co. et al No. 1 Smith C-58, C SE SW Sec. 26-5-8w. S.S.O. 5,329-58 ft.; S.O. 5,433 ft.; cd. 5,964-76 ft.; rec. sh.; cd. 6,351-76 ft.; rec. hd. sd.; T.D. 6,613 ft.; R.U.S.T.

J. M. Henry No. 1 Thomas, NE SE NE Sec. 9-5-7w. Drlg. 2,530 ft.

Ed Parsons No. 1 McKenney, SE SE SW Sec. 30-3-8w. Drlg. sh. 5,517 ft.

Hughes County

Skelton et al No. 1 Gilmore, C N½ NE SE Sec. 7-5-9. Cg. 834 ft.

Jackson County

English & Morgan No. 1 Lee, NW NW SE Sec. 36-2-19w. Drlg. 1,240 ft.

Kay County

Cooper Drlg. Co. No. 1 Caughlin, SE NE SW Sec. 30-25-1. Drlg. 2,727 ft.

Crawford No. 1 Bethel, SE SE NW Sec. 34-27-2w. T.D. 1,040 ft.; S.D.

Kingfisher County

K. A. Ellison No. 1 Baker, NE NE SE Sec. 20-19-5w. Drlg. 6,275 ft.

Ace Gutowsky No. 1 Lankford, NE NE SE Sec. 34-17-6w. Miss. 7,014 ft.; Woodford 7,531 ft.; Misener 7,562 ft.; drlg. 7,658 ft.

Kiowa County

C. J. Hagerling No. 1 Kimray, SW SW NW Sec. 36-5-18w. S.D. 750 ft.

C. H. Tidford No. 2 Meyers, C E½ SE NW Sec. 25-7-21w. O.T.D. 881 ft.; C.O.

Wichita Oil, Inc., No. 1 Mace, SW SW SW Sec. 11-5-15w. S.D. 127 ft.

McIntosh County

Scruggs et al No. 1 Lanning, SE SW SW Sec. 19-12-15. Spd.

Murray County

M. A. Saunders No. 1 Vanderslice, C SW SW Sec. 25-2-2. Arb. 3,001-05 ft., T.D.; D.&A.

Muskogee County

Petroleum No. 1 Scott, SE SW SW Sec. 14-13-19. Mch.

Okfuskee County

Carter & Hight No. 1 Rogers, SW SW SW Sec. 6-13-8. T.D. 2,850 ft.; P.B. 2,498 ft.; P. 105 B.O. in 8 hrs.; P.O.P.

Oklahoma County

R. Olsen No. 1 White, C NE NE Sec. 30-11-1. Vio. 6,338 ft.; dolo. 6,410 ft.; Wlx. 6,503 ft.; 2nd Wlx. 6,610 ft.; T. D. 6,636 ft.; to P.B.

O. A. Walters No. 1 Olmstead, C E½ SE NW Sec. 12-14-3w. Drlg. 3,221 ft.

Okmulgee County

Jim Wise Drlg. Co. No. 1 Morrow, SW NW NE Sec. 16-15-13. 3,000,000 cu. ft. gas 1,930-38 ft.; decreased to 1,000,000 cu. ft. at 1,985 ft.; T.D. 1,985 ft.; S.D.

Pawnee County

Ed Kelly No. 1 Hill, SW SW SE Sec. 1-21-5. S.D. 2,210 ft.

Pittsburg County

Phillips Pet. Co. No. 1 Hubacker, C NW NE Sec. 11-7-15. Dutcher 5,973 ft.; cg. 6,393 ft.

Pontotoc County

Union Dev. Co. No. 1-A Abbott, SW NW NE Sec. 34-3-6. S.D. 4,100 ft.

L. Walker No. 1 King, SW SE NW Sec. 5-4-7. Drlg. 905 ft.

Pottawatomie County

Grimes et al No. 1 Dye, NW NW SE Sec. 2-5-5. Wlx. 3,355 ft.; T.D. 3,379 ft.; D.&A.

Sequoyah County

Thompson Brs. No. 1 Ruby, NW NW NE Sec. 30-12-22. T.D. 1,050 ft.; rng. 8-in.

Seminole County

Atlantic Ref. Co. No. 1 Jimmey, SE NW NE Sec. 21-7-6. Drlg. 3,131 ft.

W. C. Wood No. 1 Aldridge, SW NW NE Sec. 5-8-8. T.D. 1,910 ft.; H.F.W.; S. D.O.

Stephens County

Phillips Pet. Co. No. 1 Culbertson, NW NW SE Sec. 4-1-5w. T.D. 5,606 ft. in sd.; F. 140 B.O. in 2½ hrs.

Texas County

Republic Nat. Gas Co. No. 1 Dulabohn. C Sec. 21-6n-15ecm. Drlg. 2,365 ft.

Republic Nat. Gas Co. No. 1 Judd, CSL SW Sec. 24-6n-15ecm. T.D. 2,870 ft.; gas 7,100,000 cu. ft.

Washita County

Continental Oil Co. No. 1 Proctor, C NW Sec. 28-10-20w. Cd. 10,234-53 ft.; rec. blk. L.; S.G. 10,750 ft.; to D.D.

L. B. McWhirter No. 1 fee, NW SW SW Sec. 34-8-19w. T.D. 2,190 ft.; S.D.

SOUTHERN OKLAHOMA

Carter County

Pure Oil Co. No. 1 Noble, NE SE Sec. 35-3s-1e. Cd. 6,769-80 ft.; rec. S.S.O.; to D.D.

Choctaw County

Clyde Ross et al No. 1 Hardy, SE SE NW Sec. 21-7s-15. Drlg. 1,433 ft.

Jefferson County

H. W. Weir No. 1 Carmichael, NE NE SW Sec. 23-7s-7w. W.O.C. 102 ft.

Marshall County

Hughes et al No. 1 Vittitto, C NE SE Sec. 11-5s-4e. O.W.D.D.; O.T.D. 7,100 ft.; C.O.

Tillman County

Paul Helf No. 1 Brisley, NE NE NE Sec. 22-1s-19w. Drlg. 539 ft.

R. O. Ray No. 1 Madison, NW NW SW Sec. 11-2s-16w. T.D. 1,894 ft.; abd.

ARKANSAS

Calhoun County

J. R. Lockhart No. 1 Southern Kraft Corp., SE cor. NW NW Sec. 17-14-13. O.W.W.O.; (formerly C. E. Murdock); reported T. ool. L. 4,371 ft.; S.D. 5,095 ft.; will probably set 7-in. csg. and D.D. before tstg.

Clark County

J. B. Zich, Tr., No. 1 A. P. Greene, NE cor. SE SE Sec. 21-8s-18w. Drlg. 45 ft.

Clay County

A. L. Ginther No. 1 Gordon, SE cor. SE NE Sec. 22-19n-7e. Set 10-in. csg. 60 ft.; S.D. 920 ft.

Columbia County

Atlantic Ref. Co. No. 1-C Garrett, C SW SE Sec. 13-17-20. Drlg. gr. sh. 3,935 ft.

Atlantic Ref. Co. No. 1-D L. Garrett, Sec. 24-17-20. Drlg. rd.&gr. sh. 5,700 ft.

Hassle Hunt No. 1 Tally, Sec. 14-17-20. Drlg. rd. sdy. sh. 6,913 ft.

Phillips Pet. Co. No. 1 Askew Unit, C NE NW Sec. 4-17-21. T. anhy. 3,518 ft.; rmg. to set 10¾-in. csg.; T.D. 3,641 ft.

Shell Pet. Corp. No. 1 L. Garrett, C NW SE Sec. 13-17-20. Drlg. 50 ft.

Southwood Oil Co., inc., No. 1-B L. Garrett, C SW NW Sec. 24-19n-7e. Drlg. rd. sh. 6,695 ft.

Southwood Oil Co. No. 1 L. A. Grelling, C NE NW Sec. 23-17-20. T.D. 3,790 ft.; set whipstock 2,906 ft.; drlg. rd. sdy. sh. 6,615 ft.

Southwood Oil Co., Inc., No. 2 Grelling. C SW NE Sec. 23-17-20. Drlg. rd.&gr. sh. 5,580 ft.

Standard Oil Co. of La. No. 1 J. J. Gunnels Unit, NE cor. SE NE Sec. 16-17-19. Drlg. sh.&sd. 6,150 ft.

Standard Oil Co. of La. No. 1 M. Harris, NE cor. NE SW Sec. 15-17-19. T. Bknr. L. 7,258 ft.; T. L. 7,415 ft.; rmg. to make D.S.T.

Tide Water Oil Co. No. 1 Price, C NE SW Sec. 15-18-19. Drlg. hd. sd.&sh. 6,711 ft.; T. C. V. 5,945 ft.

Vaughn & Hunt No. 1 Crisp, Sec. 23-17-20. Cd. 5,722-32 ft.; rec. 9 ft. silty por. sd.; T. Reynolds L. 7,442 ft.; cd. 7,445-65 ft.; rec. 18 ft. por. ool. L., gas odor; T.D. 7,545 ft.; 7-in. csg. 7,535 ft.; wsg. to test.

G. H. Vaughn No. 1 Baker, C NE SE Sec. 15-17-20. Drlg. rd.&gr. sh. 5,690 ft.

Hot Spring County

John H. James No. 1 Sturgess Lbr. Co., SW cor. SW SE Sec. 24-6-18. 10-in. csg. 58 ft.; cd. hd. dense gr. L. 964-78 ft.; T.D. 1,048 ft.; S.O. reported 480-82 ft. and 819-21 ft.; hd. sd.; cd. 1,048-58 ft.; rec. 5 ft. v. hd. sh.; S.D.; pmp. rep.

Lafayette County

Erwin & Leach No. 1 Patton, C S½ NW NE Sec. 24-16-24. R.U.

Standard Oil Co. of La. No. 5 McKean, SW cor. NW SE Sec. 7-16-22. Set 9⅝-in. csg. 2,047 ft.; set 6-in. csg. 7,220 ft.; drld. plug; T.D. 7,254 ft.; acdzng.

Little River County

C. & M. Drlg. Co. No. 1 Strawn, SW cor. SE Sec. 20-10-32. Cd. 1,270-80 ft.; sh.& wtr. sd.; reported S.O. 1,365-70 ft.; 1,542-64 ft. sd. and 1,564-74 ft. sdy. L.; cor. T.D. 1,598 ft.; M.I. rig.

Lonoke County

Cabot Drlg. Club, Inc., No. 1 Benson Townsite, Sec. 18-4n-8w. O.W.W.O.; O. T.D. 2,760 ft.; fsg. drlg. bit.

Lonoke-Prairie Dev. Co. No. 1 T. Young, C NW NW Sec. 8-3n-7w. Hole clean; U.R. 8¾-in. csg. 236 ft.; T.D. 300 ft., R.U. rotary tools.

W. L. Tedford No. 1 Anderson. 8-in. 400 ft.; arng. run 5-in. csg. on pkr. to S.O. wtr. flw.; set 5-in. csg. on pkr. reported 3-ft. sd. 937-40 ft.; bailed dry with S.G.; blg. est. ½ B.P.H.; est 4% oil; S.D.

Nevada County

Berry Asphalt Co. No. 2 Groves Lbr. & Tbr. Co., SW cor. SW NW Sec. 4-14-20. Drlg. sdy. sh. 965 ft.

Ouachita County

Phillips Pet. Co. No. 1 J. D. Reynolds, 330 ft. SE cor. SE NW Sec. 27-15-15. O.W.W.O.; O.T.D. 4,926 ft.; comp. as disc. well, Snow Hill field; perf. csg. 2,732-35½ ft., 2,728-31½ ft., 2,744-47½ ft., and 2,756-60 ft.; est. 2,300 ft. F.I.H., 1% oil; P.B. 2,770 ft.; set cmt. retainer 2,719 ft.; sqzd.; drlg. plug 2,746 ft.

Union County—Schuler

E. M. Jones No. 3 J. C. Morgan, Sec. 13-18-18. Drlg. rd.&gr. sh. 6,315 ft.

E. M. Jones No. 4 J. C. Morgan, C N½ NE NW Sec. 13-18-18. Drlg. rd.&gr. sh. 6,233 ft.

Lion Oil Ref. Co. No. 1 F. N. Bank, NW cor. NE Sec. 13-18-18. Drlg. 3,110 ft.

Lion Oil Ref. Co. No. 1 Calloway, NE cor. SE SE Sec. 13-18-18. Drlg. rd. sdy. sh. 6,412 ft.

Lion Oil Ref. Co. No. 1 Clay, Sec. 12-18-18. Jones sd. 7,607-55 ft.; rmg.; will drill ahead.

Lion Oil Ref. Co. No. 1 Murphy Ld. Co., Sec. 13-18-18. T. Jones sd. 7,573 ft.; T. D. 7,690 ft.; 7-in. csg. 7,681 ft.; W.O.C.

Phillips Pet. Co. No. 4 Brian, NE cor. NE SE Sec. 13-18-18. Drlg. rd.&gr. sh. 5,774 ft.

Phillips Pet. Co. No. 10 Sewell, C S½ Lot 4, SW Sec. 7-18-17. Drlg. rd.&gr. sh. 5,185 ft.

Union County—Other

Bradham & Anthony No. 3 M. H. Nash, NW cor. NE SW Sec. 7-17-13. S.W. sd.; S.O. 2,980-3,080 ft.; cd. sd. S.O. 3,123-35 ft.; 5½-in. csg. 3,175 ft.; perf. 3,124-28 ft.; swbd. S.W. sd.; S.O.; arng. P.B. 3,227 ft.

Goodwin & Markwick No. 1 Union Sawmill Co., C NW NW SE Sec. 13-18-18. Cd. 3,123-41 ft.; soft por. gr. sd. strks. asphalt; reported S.O. 2765-76 ft.; T.D. 3,315 ft.; M.I. csg.

Oliphant Oil Co. No. 1 Union Sawmill Co., C SW NW Sec. 22-19-14. Cd. 2,492-2,512 ft.; rec. 1 ft. 6 in. tight gr. sd.; set 9⅝-in. csg. 3,184 ft.; T.D. 3,188 ft.

Snuggs Sebersky & Bylick No. 1 J. N. Jerry, NE cor. SE SW Sec. 21-17-14. Cd. S.W. sd. 2,818-24 ft.; S.O. 2,885-90 ft.; D.S.T. 2,881-95 ft.; 15 min.; rec. 250 ft. mud, S.W. and S.O.; cd. sd. 2,993-98 ft. (oil) and 2,998-3,000 ft. (S. W.); S.D. 3,195 ft.; reported S.O. 2,666 ft.; P.B. 2,700 ft.; reported S.O. 2,666-94 ft.; P.B. 2,643 ft.; set 6⅝-in. csg. 2,698 ft.; drld. plug to 2,698 ft.; S.D.; W.O. 2,720 ft.

White County

G. F. Heriden et al No. 1 M. C. Wells, C SW Sec. 36-9n-8w. R.U.; W.O.

NORTH MISSISSIPPI

Clarke County

Jeremiah L. Ryan et al No. 1 M. Eddins, 500 ft. SE cor. Sec. 29-2n-14e. Drlg. 760 ft.

Hinds County

Tatum et al No. 1 S. F. Johnson, NE cor. Sec. 29-6n-1w. S.D. 5,218 ft., sd.; arng. D.D.; erecting 122-ft. drk.; R.U.

Madison County

Union Prod. Co. No. 1 Anderson, Sec. 12-8n-1w. Drlg. 359 ft.; set 13⅜-in. csg. 800 ft.; T. chk. 4,348 ft.; cg. 4,770 ft. in chk.; D.S.T. 4,401-37 ft.; S.O.&S.W.

Simpson County

Cleve Love No. 1 N. E. Garner, SW cor. SW NE Sec. 1-10n-17w. Drlg. L. 2,100 ft.

Goodwill O. & G. Co. No. 1 Berry, Sec. 33-2n-4e. D.&A. 2,810 ft.

Yalobusha County

Chas. W. Crader et al No. 1 John Bruce James, Sec. 24-11s-6w. D.&A. 3,195 ft.

FLORIDA

Nassau County

St. Mary Oil Corp. No. 1 Hilliard, Sec. 19-4n-24e. Set 6⅝-in. csg. 3,935 ft.; S. D. 4,575 ft.

Lake County

Union O. & R. Co. No. 1 Gulf Expln., Sec. 17-24s-25e. D.&A. 235 ft.

ALABAMA

Barbour County

H. A. Stebbinger et al No. 1 Mrs. Alyce Robertson, C NE NE Sec. 19-10n-25e. S.D. 4,950 ft.; set 7-in. csg. 4,500 ft.; will run 450 ft. 4½-in. perf. lnr. to bttm. to test; T.D. 5,218 ft.; D.&A.

LOUISIANA

N. LOUISIANA WILDCATS

Bienville Parish

Ark. La. Gas Co. No. 2 Gayoso, 660 ft. SW cor. SE Sec. 14-16-10. T. Tr. Pk. 5,432 ft.; D.S.T. 5,796-5,805 ft. tstd. dry in 26 min.; set 8⅝-in. csg. 6,300 ft.; drlg. sh.&L. 4,990 ft.

Bossier Parish

Triangle Drlg. Co. No. 1 Sandridge, C SE SW Sec. 14-17-12. Semiporous L. 3,203-12 ft.; set 7-in. csg. 3,200 ft.; used 500 gal. acd.; tstd. S.O.; drlg. sh.&L. 4,990 ft.

Caddo Parish

J. P. Adams et al No. 1 Stallcup, N ½ NW NW Sec. 34-22-16. 5½-in. csg. 2,460 ft.; T.D. 2,468 ft.; O.I.H.; C.I.; W. O.S.R.

J. P. Adams et al No. 2 Stallcup, SW cor. NW NW Sec. 34-22-16. Cg. 2,444 ft.

R. E. Allison No. 6 Ellerbe, SE cor. Sec. 27-18-14. Drlg. sh.&L. 4,845 ft.

R. E. Allison No. 7 Ellerbe, SW cor. Sec. 26-18-14. Drlg. 4,728 ft.

R. E. Allison No. 1 Harman, SW cor. Sec. 34-18-14. Sat. L. 5,558-75 ft.; set 5½-in. csg. 5,575 ft.; comp.; 524 B.P.D.; ½-in. ck.; C.P. 1,210 lbs.; T.P. 820 lbs.; T.D. 5,559 ft.

R. E. Allison No. 1 La. Real Estate Dev. Co., Sec. 4-17-14. P.B. 5,608 ft. to 5,575 ft.

Ballow & Williams No. 1 Crystal fee, SE cor. NE SW Sec. 24-21-16. Fsg. 270 ft.

J. M. Buckler No. 1 Barry, NE cor. NW Sec. 11-20-16. Set 10-in. 110 ft.; W.O.C.

J. M. Buckler No. 2 Stiles, NE cor. Sec. 17-21-16. 6-in. csg. 1,048 ft.; T.D. 1,051 ft.; tstd. S.W.; D.&A.

F. W. Burford No. 3 Brown, NE cor. Sec. 5-23-15. T. Gloyd 6,058 ft.; por. L. 6,085-98 ft.; set 5½-in. csg. 6,033 ft.; comp.; 111 B.P.D.; open tbg.; por. L. 6,038-57 ft. and 6,083-99 ft.; T.D. 6,125 ft.

Burnham Drlg. Co. No. 1 Wilkinson, NE cor. NE SE Sec. 33-22-16. Drlg. sh. 1,700 ft.

Carney et al No. 3 Hart, SE NW Sec. 21-21-16. Set 8-in. csg. 1,563 ft.; tstd. S.O.; acdzd. with 3,000 gal.; tstd. dry; drld. to 1,930 ft.; tstd. S.W.; P.B. 1,807 ft.; tstd. S.W.; drlg. 2,000 ft.

Paul Cooper et al No. 2 Stiles, NE cor. SW Sec. 28-21-16. Set 4-in. csg. 2,358 ft.; S.D. 2,384 ft.

H. C. Cummings No. 1 Burton, NW cor. NE Sec. 36-21-16. 5-in. csg. 2,279 ft.; T.D. 2,287 ft.; tstd. S.W.; S.O. 2,287 ft.; will P.B. 2,287 ft.

Drillers, Inc., No. 1 Ellerbe, SW cor. Sec. 23-18-14. Set surf. csg.; W.O.C.

J. P. Driscoll et al No. 1 Woolworth, SE cor. Sec. 26-20-15. Set 9⅝-in. csg. 1,370 ft.; T.D. 1,400 ft.; W.O.

Leon Dunn No. 1 Nelson, NE cor. Sec. 26-18-14. 9⅝-in. csg. 1,500 ft.; por. L. 5,552-60 ft.; set 5½-in. csg. 5,551 ft.; T.D. 5,562 ft.; comp.; 22 B.P.H.; ½-in. ck.; T.P. 150 lbs.; C.P. 500 lbs.

East Tex. Ref. Co. No. 1 McCook, Sec. 4-23-15. Drlg. sh. 3,315 ft.

W. C. Feazel No. 1 Hunter, SW cor. Sec. 23-18-14. Set 9⅝-in. csg. 1,484 ft.; por. L. 5,551-58 ft.; 5½-in. csg. 5,547 ft.; T.D. 5,560 ft.; comp.; 13 B.P.H.; ½-in. ck.; T.P. 150 lbs.; C.P. 400 lbs.

M. M. Ferrell No. 1 Satterwhite, SE NW Sec. 10-20-16. Set 6-in. csg. 1,335 ft.; tstd. S.W.; S.O. 1,580 ft.; tstg. 1,641 ft.

Harry Hanbury No. 1 Feist, C SE NW Sec. 26-18-14. Drlg. 650 ft.

Hill, Neighbors and Rowe No. 1 Thigpen, NW SE Sec. 36-21-16. 6⅝-in. csg. 2,266 ft.; W.O.S.R.

Hurricane Pet. Corp. No. 1 Harman, 660 ft. N and W. C Sec. 34-18-14. Set 5½-in. csg. 5,603 ft.; T.D. 5,615 ft.

Hurricane Pet. Corp. No. 2 Harmon, C SE SW Sec. 34-18-14. Set 13⅜-in. csg.; drlg. sd. 1,275 ft.

Lake Prod. Co. No. 1 Herndon et al, SE cor. NE SW Sec. 34-18-14. Drlg. 2,010 ft.

Wm. C. Leisk No. 1 Sinclair, NW SE Sec. 26-18-14. 13⅜-in. csg. 294 ft.; sat. L. 5,552-58 ft. and 5,560-63 ft.; set 5½-in. csg. 5,554 ft.; T.D. 5,567 ft.; flwd. 33 B.F.P.H., 35% S.W.; ¾-in. ck.; T.P. 500 lbs.; C.P. 100 lbs.; flwd. 28 B.O. and 15 bbls. S.W. per hr.; will P.B. 5,567 ft.; S.I.; P.B. 5,558 ft.; swbg. to test.

Ben Levy No. 1 Crystal fee, SW cor. Sec. 25-21-16. Set 4-in. csg. 2,250 ft.; W.O.S.R.

Lisbon-Iberia Oil Co. No. 1 Wallace, SW cor. SE Sec. 26-18-14. Drlg. L. 4,445 ft.

C. C. Lowery No. 1 Collins, NW NE Sec. 7-20-15. Drlg. sh. 1,030 ft.

Lyons et al No. 1 McFaddin, NW cor. Sec. 3-17-14. Drlg. L. 5,360 ft.

F. W. Martin Drlg. Co. No. 3 Browning, NE cor. Sec. 33-22-16. Set 5½-in. csg. 2,456 ft.; completing.

Midfield Oil Co. No. 9 Muslow, NE SW Sec. 6-20-15. 8-in. csg. 100 ft.; W.O.C.

W. R. Nicholson Oil Co. No. 1 DeSoto Corp., NW cor. Sec. 26-18-14. Sat. L. 5,556-63 ft.; set 5½-in. csg. 5,555 ft.; T.D. 5,563 ft.

W. R. Nicholson Oil Co. No. 1 Exchg. Nat. Bnk., NE cor. Sec. 26-18-14. R.U.

Oblinger & Ritter No. 1 Boisseau, SE cor. Sec. 34-21-16. Set 5-in. csg. 965 ft.; W.O.S.R. 976 ft.

Oblinger & Ritter No. 2 Boisseau, SE cor. Sec. 34-21-16. R.U.

Red Iron Drlg. Co. No. 1 Model Gardens Unit, SE cor. Sec. 23-18-14. R.U.

Texas Co. No. 21 Rainer, SE cor. SW SE Sec. 15-21-15. R.U.

Tippett Oil Corp. No. 1 Browning, SW cor. Sec. 22-22-16. Drlg. sd. 550 ft.

Tippett Oil Corp. No. 2 Stallcup, NW cor. Sec. 34-22-16. T.D. 2,456 ft.; set 5½-in. csg. 2,476 ft.

Tippett Oil Corp. No. 3 Stallcup, NW cor. Sec. 34-22-16. Set 5½-in. csg. 2,464 ft.; comp.; 250 B.P.D.; ¼-in. ck.; T.P. 200 lbs.; C.P. 310 lbs.; T.D. 2,478 ft.

R. W. Williams No. 1 Burton, SE cor. SW Sec. 36-21-16. Set 5½-in. csg. 2,247 ft.; comp.; 35 B.P.D.; pmpg.; 40% S.W.; T.D. 2,283 ft.

R. W. Williams No. 2 Crystal fee, SW cor. SE SW Sec. 24-21-16. Drlg. sh.& sd. 1,050 ft.

Wynne Drlg. Co. No. 1 Exchange Natl. Bnk., SE cor. Sec. 23-18-14. Drlg. L. 4,335 ft.

Caldwell Parish

Critchett & Woods (formerly E. T. Oakes) No. 1 Kyles, NE cor. SW NE Sec. 18-11-3e. S.D. 1,503 ft.; rig rep.

Claiborne Parish

E. T. Oakes et al No. 2 Kilgore, C NW SE Sec. 28-21-5. Hd. to slightly por. L. 5,294-5,303 ft.; 5½-in. csg. 5,287 ft.; acdzd. with 5,000 gal.; swbg.; 2,000 ft. O.I.H. 5,324 ft.; W.O.S.R.

Sinclair-Prairie Oil Co. No. 10 Langston, SE cor. SW Sec. 18-21-7. Set 7-in. csg. 1,238 ft.; comp.; pmpg. 6 B.P.D.; sd. 1,348-63 ft.; T.D. 1,408 ft.

De Soto Parish

S. S. Alexander No. 1-A Stoll, Sec. 5-12-16. Set 7-in. csg. 2,705 ft.; acd. with 3,000 gal. and tstd. est. 2,000,000 cu.ft. gas; 400 lbs.; D.S.T. 2,984-3,046 ft.; tstg 165 ft. mud cut with oil, 35 min.; set short string 5-in. csg. on bttm.; T.D. 3,145 ft.; perf. 3,000-44 ft.; 2,500 ft.; flwd. 3 days, est. 10 B.P.D. and went dead; reperf. csg. 2,995-3,045 ft. and tstg. 3,064 ft.; O.T.D. 3,145 ft.; treated with 500 gal. acd.; W.O.; hole full of oil.

T. D. Humphries No. 1 Jenkins Est., C NE SW Sec. 12-12-14. Set 10¾-in. csg. 295 ft.; W.O.C.

A. L. Sutton No. 1 Frost Lbr. Co., C NE SE Sec. 35-11-15. Set 13⅜-in. csg. 400 ft.

La Salle Parish

Stovall Drlg. Co. No. 4-B Russell, NW

cor. Sec. 25-10-1e. S.D. 1,550 ft.
G. W. Ziegen No. 16 La. Cent. Lbr. Co., SW cor. Sec. 24-11-2e. Drlg. sh. 420 ft.

Natchitoches Parish

Jack Lent et al No. 1 Whatley, SW cor. Sec. 17-10-10. S.O.&G. reported at 1,490-1,516 ft.; D.S.T. 3,282-96 ft.; tstd. 100 ft. mud cut with 40-grv. oil; P.B. 3,300 ft.; set 6⅝-in. csg. 3,282 ft.; bld. down 600 ft. of bttm.; S.S.O.; ran 2-in. tbg. and lnr. and tstd. S.O.&S.W.; T. D. 3,300 ft.; W.O.S.R.

Red River Parish

Crow Drlg. Co. No. 1 Crichton, NW NE Sec. 17-13-10. Small S.O. 3,300 ft.
H. B. Schumacher No. 1 Crichton, SW cor. NW Sec. 18-13-10. Set 8-in. csg. 1,065 ft.; tstd. S.S.O.; S.D. 1,450 ft.

Sabine Parish

Cantwell & Quick No. 1 Sabine, NE cor. SE NE Sec. 8-7-13. Drlg. ch. rk. 2,285 ft.
Geo. Ellis No. 1 Walker, 500 ft. NW cor. NW SE Sec. 8-4-12. Set 12½-in. csg. 276 ft.; reported S.O. 2,180 ft. and 2,263-65 ft.; rng. csg. 2,269 ft.; cd. sdy. sh. 2,265-69 ft.; set 7-in. csg. 2,250 ft.; W.O.C. 2,271 ft.
A. B. House No. 1 Sabine, NW NW Sec. 23-7-14. 8-in. csg. 2,134 ft.; used 7,000 gal. acd.; tstd. dry; cond. mud 3,642 ft.; arng. set 7-in. 3,500 ft.; T.D. 3,642 ft.
M. C. M. Drlg. Co. No. 2 Bowman Hicks, C NW NW Sec. 3-7-12. 6-in. csg. 2,387 ft.
Major Oil Co. No. 2-C Bowman Hicks, C NW NE Sec. 4-7-12. Set 7-in. csg. 2,492 ft.; used 2,500 gal. acd.; tstd. small S.O.&S.W.; tstd. S.S.O.&S.W.; arng. to deepen; T.D. 2,700 ft.
Major Oil Co. No. 3-C Bowman-Hicks, C SE SW Sec. 34-8-12. Set 7-in. csg. 2,400 ft.
H. M. Sneed No. 1 Leone, SW cor. NW SE Sec. 8-7-13. Set 10-in. csg. 60 ft.; W.O.C.
Williams & Spiers No. 1 Byrd, SW cor. SE NW Sec. 1-7-11. Tstg. 2,841 ft.

Tensas Parish

H. V. Schumacher No. 4 Mound Plantation, Sec. 29-11-12e. S.D. 3,002 ft.

Union Parish

Standard Oil Co. of La. and Joe Modisett No. 1-B Frost Lbr. Ind., Sec. 14-23n-2w. Drlg. rd. sh. 5,831 ft.

Webster Parish

Hassie Hunt No. 11 Davis, C SE SW Sec. 13-21-10. Hollwy. sd. 5,743-54 ft.; set 9⅝-in. csg. 5,610 ft.; comp.; 150 B.P.D.; ⅝-in. ck.; T.P. 250 lbs.; C.P. 550 lbs.; T.D. 5,950 ft.
Hassie Hunt No. 1 Hodges, C SE SE Sec. 11-21-10. Set 9⅝-in. csg. 5,967 ft.
Hunt Oil Co. No. 4 Bodcaw-Stewart, 2,155 ft. N and 660 ft. E. SW cor. Sec. 34-21-10. Holly. sd. 5,821-47 ft.; set 9⅝-in. csg. 5,802 ft.; tstd. S.O.&G. in Holly. sd.; T. "D" sd. 8,245-63 ft.; Bdcw. sd. 8,340-81 ft. (dist.); set 7-in. csg. 8,429 ft.; T.D. 8,431 ft.; recmtd.; abd csg. job; setting pkr. to test.
Hunt Oil Co. No. 5 Bodcaw-Stewart, NW cor. NE Sec. 33-21-10. Hollwy. sd. 5,734-63 ft. and 5,885-95 ft., oil; set 9⅝-in. csg. 5,938 ft.; T.D. 8,347 ft.; "D" sd. 8,165-80 ft.; (dist.); Bodcaw sd. 8,253-92 ft. (dist.); set 7-in. csg. 8,342 ft.; perforating.
Hunt Oil Co. No. 1 Miller, 100 ft. N, C NW NE Sec. 4-20-10. Drlg. sh.&L. 4,514 ft.
Hunt Oil Co. No. 1 Stewart, NW SE Sec. 32-21-10. R.U.
Magnolia Pet. Co. No. 1 Cox, C NW SW Sec. 15-21-10. Set 13⅜-in. csg. 847 ft.; 9⅝-in. csg. 5,868 ft.; "D" sd. 8,519-33 ft.; (oil at 8,519-28 ft.); Bodcaw sd. 8,627-30 ft. (gas), and 8,630-47 ft. (oil); run csg.; T.D. 8,647 ft.
Magnolia Pet. Co. and Ohio Oil Co. No. 1 Coyle-Hodges Unit, SW cor. NW Sec. 21-21-10. Set 9⅝-in. csg. 5,927 ft.; drlg. sdy. sh. 8,200 (cor.) ft.
Magnolia Pet. Co. No. 1 Roseberry Unit, 20 ft. N and W, C SE Sec. 29-23-9. Set 13⅜-in. csg. 887 ft.; T. Pettit L. 5,725 ft.; S.O. 5,764-66 ft.; T. Tr. Pk. 5,900 ft., set 9⅝-in. csg. 5,962 ft.; T. lwr. Marine 7,850 ft.; T. Bdcw. sd. 8,289 ft., S.W.; T. Davis sd. 8,548 ft.; broken gas and dist. sd. 9,145-82 ft.; T.D. 9,380 ft.; set 5½-in. csg.; flwd. 18 bbls. dist. and 146,000 cu. ft. gas in 15 hrs.; 1-in. ck.; swbd. and flwd. 49.8-gr. oil at 9,150-87 ft.
Midstates Oil Corp. No. 1 Giddens, 100 ft. NW cor. SW SW Sec. 30-21-9. Set 13-in. csg. 100 ft.; set 9⅝-in. csg. 5,794 ft.; drlg. sh.&sd. 7,121 ft.
Oliphant Oil Co. No. 2-A Stewart et al, SW cor. Sec. 33-21-10. Drlg. sh. 3,621 ft.
Union Prod. Co. No. 1 Walker Unit, 50 ft. S. C SE Sec. 30-18-8. Set 9⅝-in. csg. 6,490 ft.; T. Pettit 6,665 ft.; T. Tr. Pk. 6,910 ft.; drlg. hd. sh.&sd. 8,983 ft.

SOUTH LOUISIANA FIELDS

Abbeville—Vermilion Parish

Continental Oil Co. No. 1 Franciol, Sec. 67-12s-3e. Drk.
Continental Oil Co. No. 1 Lucion Duhon, Sec. 17-12s-3e. Drlg. sh. 7,798 ft.

Bancroft—Beauregard Parish

Republic Prod. Co. No. 6 Columbia Ld. & Tbr. Co., Sec. 15-6s-13w. T.D. 8,029 ft.; 7-in. csg. 7,407 ft.; I.P. 310 B.P.D.; ¼-in. ck.
Republic Prod. Co. No. 4 Lutcher Moore Lbr. Co., Sec. 16-6s-13w. Drk.
Republic Prod. Co. No. 1 Whitman, Sec. 15-6s-3w. R.U.
Republic Prod. Co. No. 2 Whitman, Sec. 15-6s-13w. T.D. 7,322 ft.; 7-in. csg. 7,320 ft.; I.P. 320 B.P.D.; ¼-in. ck.

Bateman Lake—St. Mary Parish

Texas Co. No. 2 State-Bateman Lake, Sec. 21-16s-12e. 13⅜-in. csg. 1,700 ft.; drlg. sh.&L. 8,713 ft.
Texas Co. No. 2 Wax Bayou Co., Sec. 21-16s-12e. Drlg. sh.&L. 9,352 ft.

Baton Rouge—East Baton Rouge Parish

Guaranty Oil Co. No. 1 D. J. Morgan. 9⅝-in. csg. 1,169 ft.
Geo. Helis et al No. 1 McInnis, Sec. 36-8s-1w. R.U.
Wm. Helis No. 4 Harry B. Nelson, Sec. 36-7s-1w. Drlg. sdy. sh. 3,919 ft.
Wm. Helis No. 1 Williams, Sec. 66-7s-1w. Drlg. sdy. sh. 2,621 ft.

Bay Baptiste—Terrebonne Parish

Fohs Oil Co. No. 1 Buckley-Mahler, Sec. 25-19s-16e. Drlg. 1,800 ft.

Bay St. Elaine—Terrebonne Parish

Texas Co. No. 2 L.L.&E., Bay St. Elaine, Sec. 18-22s-18e. T.D. 6,500 ft.; 9⅝-in. csg. 6,020 ft.; csg. collapsed; sdtrkd.; T.D. 6,991 ft.; 7-in. csg. 6,908 ft.

Bayou Blue—Iberville Parish

Humble O. & R. Co. No. 11 Wilberts, Sec. 67-9s-11e. Loc.

Bayou Choctaw—West Baton Rouge

La. Crusader No. 5 Schwing, Sec. 29-8s-11e. 9⅝-in. csg. 2,250 ft.; T.D. 4,755 ft.; P.B. 4,200 ft.; sdtrkd. 4,214 ft.; T.D. 7,878 ft.; P.B. 7,530 ft.; stk. D.S.; P.B. 5,800 ft.; sdtrkd.; T.D. 5,890 ft.; P.B. 5,200 ft.; T.D. 8,648 ft.; stk. D.S.; P.B. 4,360 ft.

Bayou des Allemands—St. Charles Parish

Amerada Pet. Corp. No. 4 St. Charles Ld. Co., Sec. 13-15s-2e. Loc.

Caillou Island—Terrebonne Parish

Texas Co. No. 29 State, Sec. 17-23s-20e. Rig.
Texas Co. No. 55 State, Sec. 20-23s-20e. Drlg. sh. 5,727 ft.

Cameron Meadows—Cameron

Burton-Sutton Oil Co. No. 26 Sch. Ld., Sec. 16-14s-13w. T.D. 2,465 ft.; 13⅜-in. csg. 2,465 ft.; T.D. 6,564 ft.; P.B. sdtrkd.; drlg. sh. 7,935 ft.

Chacahoula—La Fourche Parish

Sun Oil Co. No. 5 Dibert, Stark & Brown Cypress Co., Sec. 70-15s-15e. 16-in. csg. 110 ft.; 10¾-in. csg. 1,865 ft.; T.D. 6,055 ft.; stk. D.S.; P.B. and sdtrkd. at 3,718 ft.; drld. to T.D. 4,312 ft.; P.B. 1,850 ft.; sdtrkd.; drlg. sh. 6,225 ft.
Sun Oil Co. No. 4 Delbert Stark and Brown Cypress Co., Sec. 70-15s-15e. T.D. 7,794 ft.; P.B. 6,764 ft.; sdtrkd.; T.D. 8,268 ft.; stk. D.S.; shot at 8,195 ft.; P.B. 7,642 ft.; sdtrkd. 7,642 ft.; T. D. 8,260 ft.; 9⅝-in. csg. 8,260 ft.
Sun Oil Co. No. 1 Dodge, Sundberry & Latham, Sec. 65-15s-15e. Bldg. road.

Chalkley Field—Cameron Parish

Humble O. & R. Co. No. 2 Cameron Par. Sch. Ld., Sec. 16-12s-6w. T.D. 8,900 ft.; P.B. 8,860 ft.; perf. csg. 8,846-50 ft.; tstd. S.W.; reperf. csg. 8,786-96 ft.; tstd. S.W.; reperf. csg. 8,664-68 ft.; flwd. 18 bbls. first 15 hrs.; ¼-in. ck.
Humble O. & R. Co. No. 3 K. B. Hanzen, Sec. 9-12s-6w. M.I.M.
Humble O. & R. Co. No. 2 Sweet Lake Ld. & Oil Co., Sec. 8-12s-6w. Loc.
Shell Pet. Corp. No. 1-A Katherine Bel Hanzen, Sec. 15-12s-6w. Dredge canal.

Charenton—St. Mary Parish

Commerce Oil Co. No. 1 T. Brulation, Sec. 19-13s-10e. Loc.
Kinsley Oil, Inc., No. 1-B Hertel, Sec. 30-13s-9e. Loc.
Pan American Prod. Co. No. 1 Achee, Sec. 21-13s-9e. Loc.
Pan American Prod. Co. No. 12 Laws Realty Co., Sec. 36-13s-9e. 8⅝-in. csg. 985 ft.; T.D. 7,210 ft.; 5½-in. csg. 6,504 ft.; tstd. S.W. 6,463-80 ft.
Pan American Prod. Co. No. 13 Laws Realty, Sec. 30-13s-10e. Loc.
Pan American Prod. Co. No. 14 Laws Realty Co., Sec. 30-13s-10e. Loc.
Pan American Prod. Co. No. 12 Veeder, Sec. 11-13s-9e. T.D. 2,626 ft.; 7-in. csg. 2,600 ft.; I.P. 250 B.P.D.; ⅛-in. ck.
Pan American Prod. Co. No. 13 Veeder, Sec. 30-13s-10e. Bldg. road.
J. P. Scranton No. 1 State Bayou, Sec. 30-13s-10e. 5½-in. csg. 7,878 ft.; T.D. 7,896 ft.; I.P. 700 B.P.D.; ¾-in. ck.

Cheneyville—Rapides Parish

Sid Richardson No. 1 Well Co., Inc., Sec. 55-1s-2e. Drlg. sh. 6,735 ft.; T. Cockfield 5,936 ft.
Texas Canadian Oil Co. No. 1 Myrtle R Pope, Sec. 4-1s-2e. Drlg. sdy. sh. 5,417 ft.

Convent—St. James Parish

Continental Oil Co. No. 2 Realty Operators, Inc., Sec. 16, 13⅜-in. csg. 1,492 ft.; T.D. 7,889 ft.; P.B. 7,275 ft.; sdtrkd. 7,305 ft.; T.D. 8,235 ft.; well blew out; caught fire; cleaned hole to 4,866 ft.; P.B. 4,603 ft.

Creole—Cameron Parish

Superior Oil Co. No. 6 State-Gulf of Mexico. Drlg. sd.&sh. 4,390 ft.

Darrow—Ascension Parish

Humble O. & R. Co. No. 21 Community, Sec. 31-10s-2e. R.U.
Kiva Oil Co. No. 1 Duplessis, Sec. 69-10s-2w. S.D. 2,523 ft.

Dog Lake—Terrebonne Parish

Texas Co. No. 9 State, Sec. 5-22s-16e. Drlg. sdy. L. 5,359 ft.

Eola—Avoyelles Parish

J. E. Jones No. 1 Haas Inv. Co., Sec. 8-2s-3e. Drlg. sh. 6,458 ft.
O'Meara Bros. No. 1 W. F. Kelley, Sec. 7-2s-3e. 13⅜-in. csg. 15 ft.; W.O. permit.
Pomo Prod. Co. No. 1 S. W. Sentel, Sec. 5-2s-3e. Drlg. sd.&sh. 8,418 ft.
Sid Richardson No. 4 Haas Inv. Co., Sec. 7-2s-3e. Drlg. sh. 5,420 ft.
Sid Richardson No. 1 State Bayou, Sec. 7-7s-2e. Drlg. 120 ft.
Sun Oil Co. No. 1 E. A. Townsend, Sec. 8-2s-2e. R.U.

Fausse Point—Iberia Parish

Texas Co. No. 5 State Lake-Fausse Point, Sec. 35-11s-8e. T.D. 12,125 ft.; will run 5-in. csg.

Garden Island—Plaquemines Parish

Texas Co. No. 33 State, Sec. 38-23s-33e. 16-in. csg. 551 ft.; drlg. sh. 2,630 ft.

Gibson—Terrebonne Parish

Shell Pet. Corp. No. 3 R.E.K., Sec. 40-17s-15e. Drlg. sh. 2,004 ft.

Gillis—Calcasieu Parish

Union Sulphur Co. No. 8 Kaufman, Sec. 7-9s-8w. Drlg. sh.&L. 7,251 ft.

Golden Meadows—La Fourche Parish

Martex Pet. Corp. No. 1 Falgout Holding Co., Inc., Sec. 9-19s-22e. Cd. sh.& sd.; O.S. 2,636-45 ft. and oil sd. 2,645-54 ft.; T.D. 6,844 ft.; fsg. for D.S.

Grand Bay—Plaquemines Parish

Gulf Oil Corp. No. 4 Grand Prairie Lve. Dist., Sec. 48-20s-18e. Drlg. sd. 1,600 ft.
Gulf Oil Corp. No. 2 State, Sec. 6-20s-19e. Drlg. sh. 6,324 ft.

Hackberry—Cameron Parish

F. W. Bennett No. 1 Bickford, Sec. 37-12s-10w. 7-in. csg. 7,037 ft.; T.D. 8,104 ft.; stk. D.S.; S.D.
Gulf Oil Corp. No. 25-A Erwin, Sec. 13-12s-10w. Drk.
Superior Oil Co. No. 1 Kaough, Sec. 31-12s-10w. Drk.
Superior Oil Co. No. 2-C Kaough, Sec. 30-12s-10w. T.D. 7,315 ft.; perf. csg. 6,672-6,750 ft.; I.P. 50 B.P.D.; 10/64-in. ck.
Texas Co. No. 25-B State, Twp. 12s-9w. Drlg. sd.&L. 7,275 ft.
Union Sulphur Co. No. 8 Caldwell, Sec. 37-2s-10w. Loc.
Union Sulphur Co. No. 12 Doiron, Sec. 37-12s-10w. Drlg. sh. 7,479 ft.
Union Sulphur Co. No. 13 Doiron, Sec. 27-12s-10w. S.D. 5,221 ft.
Union Sulphur Co. No. 1 Josephine O'Quinn, Sec. 37-12s-10w. Drlg.sh.&L. 6,720 ft.
Union Sulphur Co. No. 45 Watkins, Sec. 13-12s-10w. T.D. 3,203 ft.; P.B. 1,400 ft.; sdtrkd. 1,483 ft.; T.D. 3,211 ft.; 5-in. csg. 3,203 ft.; perf. csg. 3,070-80 ft.; tstg.; no ga.

Horseshoe Bayou—St. Mary Parish

Texas Co. No. 2 State, Sec. 37-17s-9e. 9⅝-in. csg. 11,631 ft.; T.D. 12,770 ft.; set 1,659 ft. of 6⅝-in. csg. at 12,645 ft.; set 70 ft. of 6⅝-in. csg. 8,473 ft.; prep. to perf. csg. 11,782-11,847 ft.; hung slotted pipe; perf. csg. 11,792-11,804 ft. and 11,820-47 ft.; I.P. 25 bbls. dist.; 10/64-in. ck.

Jefferson Island—Iberia Parish

Texas Co. No. 2 Jefferson Island, Sec. 58-12-5e. 18⅝-in. csg. 40 ft.; 7⅝-in. csg. 8,451 ft.; drlg. 8,903 ft.
Texas Co. No. 2 State-Lake Peigneur, Twp. 12s-5w. Drlg. sdy. sh. 4,538 ft.

Jeanerette—St. Mary Parish

Herton Oil Co. No. 9 Banta, Sec. 40-13s-9e. Drlg. sh. 6,027 ft.

Jennings—Acadia Parish

W. T. Burton No. 6 Roboria, Sec. 41-9s-2w. 7-in. csg. 6,721 ft.; fsg. tbg.; T.D. 6,997 ft.; sdtrkd. at 6,118 ft.; drld. to 6,178 ft.; sdtrkd. at 6,023 ft.; T.D. 6,732 ft.; trying to drill by fish; P.B. 6,104 ft.; W.O.C.; sdtrkd. 6,020 ft.; T.D. 6,056 ft.; 7-in. csg. 2,203 ft. and 10¾-in. csg. 2,108 ft.; sdtrkd.; drld. into old hole; P.B.; sdtrkd. 2,302 ft.; T.D. 6,763 ft.; 7-in. csg. 6,711 ft.; perf. csg. 6,292-6,430 ft.; flwd. some oil, then went dead; P.B. 6,450 ft.; W.O. S.R.
W. T. Burton No. 7 Roberia, Sec. 41-9s-2w. Drlg. sh.&L. 4,731 ft.
Glassell & Glassell No. 7 McFarlain, Sec. 41-9s-2w. Drlg. sh. 5,012 ft.
Gulf Oil Corp. No. 41 Arnaudet, Sec. 47-9s-2w. 9⅝-in. csg. 4,557 ft.; drlg. sd. 4,600 ft.
Shell Pet. Corp. No. 6 Conover, Sec. 40-17s-15e. Drlg. sh.&L. 5,476 ft.
Stanolind O. & G. Co. No. 114 Crowley Oil & Mineral Co., Sec. 48-9s-2w. Spd.

Lafitte—Jefferson Parish

Texas Co. No. 2 Sch. Bd., Sec. 20-17s-24e. Drlg. sdy. sh. 5,643 ft.
Texas Co. No. 2 State-Bayou Norman, Sec. 21-17s-24e. Canal completed.

Lake Barre—Terrebonne Parish

Texas Co. No. 43 State, Sec. 30-21s-20e. Drlg. sdy. L. 2,677 ft.

Lake Long—La Fourche Parish

Fohs Oil Co. No. 8 State, 17s-19e. Drlg. sh. 3,630 ft.

Lake Mongoulois—St. Martin Parish

Texas Co. No. 7 State, Sec. 10-10s-9e. Driving piling.

Lake Pelto—Terrebonne Parish

Texas Co. No. 23 State, Twp. 23s-18e. T. salt 6.055 ft.; T.D. 6,225 ft., salt; P.B. 4,750 ft.; sdtrkd.; drlg. sh. 6,076 ft.

Lirette—Terrebonne Parish

Humble O. & R. Co. No. 2 H. J. Ellender, Sec. 32-19s-19e. Cd. sd. S.G. 10,465-74 ft.; 9⅝-in. csg. 8,614 ft.; T.D. 11,610 ft.; perf. csg. 8,285-95 ft.; tstg.

Lockport—Cameron Parish

Continental Oil Co. No. 2 J. H. Moss, Sec. 8-10s-9w. Drlg. sh. 7,210 ft.

New Iberia—Iberia Parish

Wm. Helis No. 7 Bolivar, Sec. 56-12s-7e. T.D. 3,282 ft.; 7-in. csg. 3,159 ft.; perf. csg. 3,040-50 ft.
Wm. Helis No. 8 Bullock, Sec. 25-12s-7e. T.D. 5,846 ft.; perf. csg. 5,765-5,805 ft.; I.P. 430 B.P.D.; 1/64-in. ck.
Lisbon-Iberia Oil Corp. No. 7 Gulf fee, Sec. 25-12s-7e. Drlg. sh. 5,001 ft.
Texas Co. No. 2 Bryant, Sec. 25-12s-7e. R.U.
Texas Co. No. 6 Bryant, Sec. 25-12s-7e. T. salt 3,468 ft.; T.D. 3,476 ft.; 7-in. csg. 2,982 ft.
Texas Co. No. 1 DeCuir, Sec. 25-12s-7e. Drlg. sh.&L. 5,848 ft.
Texas Co. No. 2 Gonsoulin, Sec. 13-12s-7e. Drlg. sh. 9,821 ft.
Texas Co. No. 2-A Hanzon, Sec. 54-12s-7e. 7⅝-in. csg. 8,075 ft.; drlg. sh. 8,640 ft.
Texas Co. No. 1 Renaudet et al, Sec. 71-12s-7e. 9⅝-in. csg. 8,338 ft.; T. salt 9,293 ft.; T.D. 9,313 ft.; 6⅝-in. csg. 9,283 ft.; will test sd. 8,930-70 ft.

North Crowley—Acadia Parish

Humble O. & R. Co. No. 4 Ohlenforst, Sec. 45-8s-1e. Drlg. sh. 7,732 ft.

North Tepetate—Acadia Parish

Atlantic Ref. Co. No. 1 Aden & Doga, Sec. 11-7s-2w. 16-in. csg. 319 ft.; cg. sh. 8,617 ft.
Atlantic Ref. Co. No. 4 Klumpp, Sec. 12-7s-2w. T.D. 8,556 ft.; 7-in. csg. 8,556 ft.; perf. csg. 8,511-14 ft.; I.P. 13 bbls. 4 hrs.; ⅛-in. ck.
St. Mary Oil Co. No. 1 Dr. H. Jenkins, Sec. 12-7s-2w. Loc.

Port Barre—St. Landry Parish

Pan American Prod. Co. No. 4 H. L. Garland, Sec. 4-6s-5e. T.D. 4,815 ft.; run electrical survey.
Y. D. Spill No. 1 Gaudet, Sec. 4-6s-5e. S.D. 4,700 ft.
Western Gulf Prod. Co. No. 1 Watkins, Sec. 4-6s-5e. Loc.

Potash—Plaquemines Parish

Humble O. & R. Co. No. 38 Orleans Lve. Dist., Sec. 13-18s-15e. 13⅜-in. csg. 2,957 ft.; drlg. sh. 4,837 ft.

Quarantine Bay—Plaquemines Parish

Gulf Oil Corp. No. 1 Grand Prairie Lve. Dist., Sec. 18-19s-17e. Drlg. sh. 675 ft.
Gulf Oil Corp. No. 1-A Plaquemines Ld. Co., Sec. 18-19s-17e. T.D. 8,186 ft.; 7-in. csg. 8,100 ft.; I.P. 378 B.P.D.; ¼-in. ck.
Gulf Ref. Co. No. 5 State, Sec. 17-19s-17e. Loc.
Gulf Oil Corp. No. 8 State, Sec. 18-19s-17e. T.D. 8,175 ft.; 7-in. csg. 8,100 ft.
Gulf Oil Corp. No. 9 State QQ, Sec. 18-19s-17e. Loc.

Raceland—La Fourche Parish

Amerada Pet. Corp. No. 1 Godchaux Sugars, Inc., Sec 34-15s-19e 18⅝-in. 11,312 ft.; T.A.
Amerada Pet. Corp. No. 4 South Coast Corp., Sec. 34-15s-19e. R.U.
Tide Water Asso. Oil Co. No. 2-A South Coast Corp., Sec. 34-15s-19e. M.I.M.

Roanoke—Jeff Davis Parish

Humble O. & R. Co. No. 1 Ferguson, Sec. 13-9s-4w. Drlg. sh. 6,125 ft.

South Roanoke—Jeff Davis Parish

Continental Oil Co. No. 2 Sturdivant, Sec. 36-10s-4w. T.D. 9,825 ft.; 8⅝-in csg. 9,825 ft.; T.D. 9,920 ft.; flwd. 98 bbls. dist.; 14 hrs.; 5/32-in. ck.; separator froze; close in; sd. 9,884-9,909 ft.

Timbalier Bay—La Fourche Parish

Gulf Oil Corp. No. 4 State, T.D. 7,268 ft.; sdtrkd.; 5-in. csg. 5,320 ft.; T.D. 5,340 ft.; failed to flow; pulling screen and lnr.

Valentine—La Fourche Parish

Pan American Prod. Co. No. 19 Harang, Sec. 8-17s-20e. Drlg. sh.&shls. 5,380 ft.
John Vacarro et al No. 2 Acosta Hrs., Sec. 9-17s-20e. T.D. 540 ft.

Villa Platte—Evangeline Parish

Continental Oil Co. No. 2 Fontenot-Ladeau, Sec. 45-3s-2e. Loc.
Continental Oil Co. No. 3 Haas, Sec. 44-3s-2e. Drlg. sh. 7,426 ft.
Continental Oil Co. No. 3 Opelousas-St. Landry Securities Co., Sec. 44-3s-2e. T.D. 9,063 ft.; run csg.
Continental Oil Co. No. 4 Pierre McDaniel, Sec. 45-3s-2e. Drk.
Continental Oil Co. No. 1 Rene McDaniel, Sec. 45-3s-2e. T.D. 9,078 ft.; run csg.
Continental Oil Co. No. 1 Tate, Sec. 45-3s-2e. Oil sd. 8,891-8,904 ft.; drlg. sd. &sh. 10,350 ft.
Continental Oil Co. No. 3 Ed Tate, Sec. 45-3s-2e. Drlg. sdy. sh. 5,735 ft.

Texas Co. No. 3 Marman fee, Sec. 45-3s-2e. Drlg. sh. 4,078 ft.

Venice—Plaquemines Parish

Tide Water Asso. Oil Co. No. 5 Buras Lv. Bd., Sec. 23-21s-30e. Loc.
Tide Water Asso. Oil Co. No. 4 Buras Levee Dist., Sec. 23-21s-20e. T. salt 3,120 ft.; sdtrkd.; cg. wtr. sd. 5,761 ft.

Vinton—Calcasieu Parish

J. Rediek et al No. 4 Vincent Hrs., Sec. 66-10s-12w. T.D. 2,453 ft.; perf. csg. 2,126-40 ft.; sanded up; stk. tbg.; fsg.

Woodlawn—Jeff Davis Parish

Union Sulphur Co. No. 4 Calcasieu Natl. Bnk., Sec. 12-9s-6w. T.D. 8,905 ft.; perf. csg. 8,867-73 ft.; flwg. est. 150 B.P.D.; killed; P.B. 8,875 ft.; sqzd. perf.
Union Sulphur Co. No. 1 Dovaran-O'Connor, Sec. 12-9s-6w. Drlg. sdy. sh.&L. 8,478 ft.
Union Sulphur Co. No. 2 Miller, Sec. 7-9s-5w. Loc.
Union Sulphur Co. No. 3 Mrs. O'Miller, Sec. 7-9s-5w. Drlg.
Union Sulphur Co. No. 2 Osmon, Sec. 7-9s-5w. T.D. 9,111 ft.; P.B. 5,910 ft.; sdtrkd.; drlg. sh.&L. 8,511 ft.

S. LOUISIANA WILDCATS

Acadia Parish

T. G. Markley No. 1 M. L. Vincent, Sec. 19-17s-1w. Loc.
T. T. Tolson et al No. 1 J. Turner, Sec. 25-7s-1e. M.I.M.
Tri Parish Drillers, Inc., No. 1 Paul Stag, Sec. 4-7s-1w. Drlg.

Allen Parish

Bel Oil Corp. No. 1 J. A. Bel, Sec. 22-6s-3w. Cd. gas sd. 6,257-87 ft.; S.W. sd. 6,287-97 ft.; drlg. sh.&sd. 7,002 ft.

Assumption Parish

Shell Oil Co. No. 1 Ellis, Sec. 66-16s-14e. Loc.

Beauregard Parish

Atlantic Ref. Co. No. 1 Lutcher Moore, Sec. 22-3s-11w. Loc.
Atlantic Ref. Co. No. 1 Rice Ld. & Lbr. Co., Sec. 22-3s-11w. Loc.
Atlantic Ref. Co. No. 1-A Rice Ld. & Lbr. Co., Sec. 22-3s-11w. Drlg. sh. 4,107 ft.
Standard Oil Co. of Calif. No. 1 Long Bell Lbr. Co., Sec. 23-4s-9w. Loc.

Calcasieu Parish

David B. MacDaniel No. 2 Sch. Ld., Sec 16-9s-7w. 15½-in. csg. 46 ft.; 10¾-in csg. 1,299 ft.; T.D. 7,890 ft.; S.D.
Union Sulphur Co. No. 1 Ulrich, Sec. 19-9s-10w. R.U.

Cameron Parish

Superior Oil Co. No. 2 John Sells, Sec. 4-15s-8w. T.D. 7,000 ft.; P.B.; sdtrka., T.D. 6,888 ft.; abd.
Superior Oil Co. et al No. 1 State, Grand Lake, Sec. 24-13s-4w. T.D. 103 ft.; T.D. 260 ft.
Union Sulphur Co. No. 1 Sweet Lake Ld. Co., Sec. 9-12s-7w. Drlg. 50 ft.

East Baton Rouge Parish

Danciger O. & R. Co. No. 1 D. E. McInnis, Sec. 58-7s-1e. Loc.

Evangeline Parish

Continental Oil Co. et al No. 1 Mrs. Lillie Manuel, Sec. 33-4s-1w. Loc.

Iberia Parish

Texas Co. No. 1 Petit Anse, Sec. 59-13s-6e. Drlg. sdy. sh. 10,728 ft.
Texas Co. No. 3-B State-Vermilion Bay, Twp. 16s-5e. T. salt 5,970 ft.; T.D. 6,241 ft.

Iberville Parish

California Co. No. 1 Schwing Lbr. Co., Sec. 96-10s-10e. 20-in. csg. 177 ft.; 9⅝-in. csg. T.D. 10,106 ft.; twisted off drill collar; P.B.; sdtrkd. 9,613 ft.; drlg. sh. 11,338 ft.
Humble O. & R. Co. No. 1 Iberville Mortgage Loan Co., Inc., Sec. 74-7s-10e. 20-in. csg. 208 ft.; drlg. sd. 8,016 ft.
Shell Pet. Corp. No. 1 Natalbany Lbr Co., Sec. 18-9s-2e (tight well). Cg. 9,312 ft.

Jeff Davis Parish

R. M. Bleakie et al No. 1 Lack-Moore Co., Ltd., Sec. 29-7s-6w. R.U.
Union Sulphur Co. No. 1 H. B. Tietje, Sec. 36-7s-4w. Drlg. sh.&L. 6,402 ft.

La Fourche Parish

Gulf Oil Corp. No. 1 Grandison Ld. Co., Sec. 14-20s-23e. Drlg. sh. 2,450 ft.
J. Perry Scranton No. 2 Martinez, Sec. 132-15s-17e. Bldg. rd.
Texas Co. No. 1 L.L.&E. Golden Meadows, Sec. 77-19s-21e. 9⅝-in. csg. 10,744 ft.; drlg. sdy. sh. 11,528 ft.

Orleans Parish

W. T. Burton No. 1 L.&N.R.R., Sec. 18-11s-15e. Drlg. sd. 8,105 ft.
W. T. Burton No. 3 L.&N.R.R., Sec. 25-11s-14e. Loc.
W. T. Burton No. 1-B R. E. E. de Montluzin, Sec. 1-10s-13e. Loc. abd.

Plaquemines Parish

Texas Co. No. 1 L.L.&E., Bastian Bay, Sec. 43-20s-28e. 9⅝-in. csg. 9,540 ft.; drlg. sh. 10,420 ft.

Pointe Coupee Parish

Falcon-Seaboard No. 1 J. H. Hobgood, Sec. 8-1s-7e. R.U.

Rapides Parish

E. J. Gann et all No. 1 Lee Lbr. Co., Sec. 9-5n-3e. O.W.D.D.; T.D. 140 ft.
Gulf States Explin. No. 1 Erwin & Bishop, Sec. 35-1n-3w. Cd. Wlx. sd.; no show 7,490-7,519 ft.; S.D. 7,523 ft.
Lyons & Neely No. 1 W. P. Aertker, Sec. 16-4n-1e. Drlg. sh. 2,940 ft.

St. Bernard Parish

Gulf Ref. Co. No. 4-State-R.R. (Lake Borgne), Twp. 12s-15e. 9⅝-in. csg. 8,161 ft.; T.D. 10,632 ft.; P.B. 9,700 ft.; rmd. to 9,658 ft.; lost core bbl.; P.B. sdtrkd. 8,912 ft.; drlg. sh. 9,200 ft.
Vendome Pet. Corp. No. 1 Kenilworth Plantation, Sec. 59-13s-14e. 9⅝-in. csg. 10,809 ft.; cd. 10,880-10,900 ft., sdy. sh.; gas odor; cd. gas sd. 10,990-11,050 ft.; T.D. 11,469 ft.; 7-in. csg. 11,469 ft.; perf. csg. 11,200-20 ft.; flwd. S.W.; no show oil or gas; pulled tbg. in two; fsg.; P.B. 10,736 ft.; perf. csg. 10,608-26 ft.; flwg. 480 B.F.P.D.; 13/64-in. ck.; T.P. 1,000 lbs.; C.P. 800 lbs.; S.I.; 35% fluid b.s.&S.W.; 60% 34-gr. oil; tstg.

St. Charles Parish

Texas Co. No. 1 L.L.&E. Paradis, Sec. 39-14s-20e. 9⅝-in. csg. 8,975 ft.; drlg. sh. 10,320 ft.

St. James Parish

Shell Pet. Corp. No. 1 Shexnayder, Sec. 38-12s-15e. 9⅝-in. csg. 8,534 ft.; drlg. sdy. L. 10,998 ft.

St. Martin Parish

Magnolia Pet. Co. No. 1 Mercelin Francois, Sec. 8-10s-7e. Cg. sh. 8,716 ft.
Roper & Todd No. 1 Levert Plantation, Lot 40, Sec. 42-10s-7e. Bldg. drk.

St. Mary Parish

Phillips Pet. Co. No. 1 Whitney Natl. Bnk., Sec. 13-15s-12e. Cg. sdy. sh. 10,870 ft.

Terrebonne Parish

Humble O. & R. Co. No. 1 W. E. Mount, Sec. 32-19s-19e. Loc.
Texas Co. No. 2 State-Coon Point, Twp. 23s-14e. 13⅜-in. csg. 1,900 ft.; T.D. 2,851 ft.; driving piling; bldg. drk.

TEXAS

Week Ending April 8

GULF COAST FIELDS

Hastings Field—Brazoria-Galveston Counties

Humble O. & R. Co. No. 1 H. L. Beeck, B.S.&F. Sur. No. 6. T.D. 6,640 ft.; abd.

Old Ocean—Brazoria County

Harrison & Abercrombie No. 5 Armstrong, Polly & Chance Sur. Drlg. sh. &L. 9,839 ft.
Harrison & Abercrombie No. 6 Bernard River Ld. & Dev. Co., C. Breen Sur. 9⅝-in. csg. 6,996 ft.; T.D. 10,472 ft.; comp.; no ga.
Harrison & Abercrombie No. 4 Chenault, C. Breen Sur. 13⅜-in. csg. 1,523 ft.; drlg. sdy. sh. 8,996 ft.
Harrison & Abercrombie No. 1 C. W. Markle, Polly & Chance Sur. Loc.
Sun Oil Co. No. 1 Borsoti-Elkins C. Breen Sur. 18⅝-in. csg. 121 ft.; drlg. sd.&sdy. sh. 1,860 ft.

Cedar Point—Chambers County

Standard Oil Co. of Calif. et al No. 46-120 State. Loc.
Standard Oil Co. of Texas et al No. 56-94 State. T.D. 6,950 ft.; P.B. 4,300 ft.; sdtrkd.; drlg. sh. 5,058 ft.

Seabreeze—Chambers County

Sun Oil Co. No. 4-A Hebert-Broussard, T.&N.O. Sur. No. 127. Drlg. sh. 5,367 ft.
Sun Oil Co. No. 1 Pipkin, W. M. Mays Sur. No. 104. T.D. 8,640 ft.; perf. csg. 8,320-55 ft.; swbg.

Turtle Bay—Chambers County

Stanolind O. & G. Co. No. 1 Tassie Lotz, J. B. Jamison Sur. 9⅝-in. csg. 1,241 ft.; T. S.W. sd. 6,700 ft.; T.D. 6,777 ft.; P.B. 6,590 ft.; W.O.

West Columbia—Brazoria County

Frost & Dunman No. 1 E. C. Parker, G. Tennille Sur. T.D. 5,319 ft.; W.O.C.
General Crude Oil Co. No. 1-B Campbell, S. M. Williams Sur. T.D. 7,000 ft.; abd.
Texas Co. No. 5 Goldman, G. Tennille Sur. Drlg. sh.&L. 4,430 ft.
Texas Co. No. 12 Phillips G. Tennille Sur. T.D. 5,805 ft.; 7-in. csg. 5,797 ft.

Caplen—Galveston County

Sun Oil Co. No. 1 Hudnall, Finn & Foreman, S. F. Hughes Sur. Spd.

League City—Galveston County

Geo. Echols No. 3 Ross-Stewart, Perry & Austin Sur. 10¾-in. csg. 2,560 ft.; drlg. sh. 8,569 ft.
Midstates Oil Co. No. 2-A Maco Stewart, Perry & Austin Sur. T.D. 10,337 ft.; 7-in. csg. 9,146 ft.; perf. csg. 8,965-80 ft.; flwd. oil and S.W.; killed; sqzd. perf.; reperf. csg. 8,968-73 ft.; flwg. oil and wash wtr.
Phillips Pet. Co. No. 1 Bertha Lobit Wilson, Perry & Austin Sur. Drlg. sd.& L. 9,656 ft.
Phillips Pet. Co. No. 1 Bryan, Perry & Austin Sur. R.U.
Phillips Pet Co. No. 1 J. C. Ott, S. F. Austin Sur. Cd. O.S. 7,070-9,110 ft.; T.D. 10,545 ft.; 5½-in. csg. on bttm.; perf. csg. 9,245-63 ft.; flwd. brksh. wtr. some oil; perf. csg. 9,242-60 ft.; flwg. into pits; est. 12 B.F.P.H.; ⅞-in. ck.; 34% brksh. wtr.; killed to perf. csg. 9,110-15 ft.; flwg. 7 B.P.H.; ⅛-in. ck.; T.P. 3,125 lbs.; C.P. 3,500 lbs.; killed; perf. csg. 9,250-56 ft.; flwg. 6 B.F.P.H.; 7/64-in. ck.; began to show S.W.; killed; sqzd. perf.; W.O.C.
Salt Dome Oil Corp. No. 2 Ross-Stewart, Perry & Austin Sur. T.D. 9,000 ft.; 5½-in. csg. on bttm.; perf. csg. 8,696-8,700 ft.; tstg.
West Prod. Co. No. 1 fee, Lot 2, Blk. 5, Perry & Austin Sur. Loc.

Bammel—Harris County

Hamill & Smith No. 1 Sweeney, W.C.R. R. Sur., Sec. 10, Blk. 4. 10¾-in. csg. 1,000 ft.; T.D. 6,510 ft.; abd.

Clear Lake—Harris County

Humble O. & R. Co. No. 7-C Humble-West fee, J. Lindsey Sur. Drlg. sh. 4,337 ft.

Clinton—Harris County

Stanolind O. & G. Co. No. 2 Edwards, Reels & Trobough Sur. Drk.

Eureka—Harris County

Jack Frazier No. 1 W. T. Helberg, H. Reinerman Sur. R.U.
Houston Oil Co. No. 3 Helberg & Lackner, J. Reinerman Sur. Loc.
Houston Oil Co. No. 2 D. Lackner, H. Reinerman Sur. Drlg. sh. 6,939 ft.

Fairbanks—Harris County

Sinclair Prairie Oil Co. No. 3 Goodykoontz, W. S. Powell Sur. Drlg. sh. 967 ft.
Stanolind O. & G. Co. No. 2 Look, S. Lewis Sur. Drlg. sd.&sh. 3,697 ft.

Friendswood—Harris County

Humble O. & R. Co. No. 1-B Herman Hospital, T. Choate Sur. T.D. 6,045 ft.; W.O.C.
Humble O. & R. Co. No. 18-B Humble-West, Luke Hemenway Sur. Drlg. sh. 4,637 ft.
Humble O. & R. Co. No. 20-B Humble-West, Luke Hemenway Sur. Drlg. sh. 4,039 ft.
Humble O. & R. Co. No. 1 West Prod. Co.-Herman Hospital Est., Luke Hemenway Sur. T.D. 6,046 ft.; tstg.
Humble O. & R. Co. No. 13 West Prod. Co., Luke Hemenway Sur. T. sd. 5,412 ft.; T.D. 6,047 ft.; tstg.

Satsuma Field—Harris County

Amerada-Stanolind O. & G. Co. No. 1-A W. S. Jacobs, W.C.R.R. Sur. No. 2. S.D. 6,906 ft.
Moore & Ahern et al No. 1 Zagist, F. Fry Sur. S.D. 6,952 ft.
H. E. Williams et al No. 1 Cruice, T. Hogan Sur. Cg. 6,837 ft.

Cheek—Jefferson County

Humble O. & R. Co. No. 2 Broussard, C. Hillebrandt Sur. Drlg. sh. 6,375 ft.
Humble O. & R. Co. No. 3 Broussard Tr., C. Hillebrandt Sur. Dig. pits.
Humble O. & R. Co. No. 2 Fallor, C. Hillebrand Sur. Loc.
Humble O. & R. Co. No. 4 Jefferson Ld. Co., C. Hillebrand Sur. R.U.
Humble O. & R. Co. No. 2 Margaret Todd, Wm. Carr Sur. 9⅝-in. csg. 1,549 ft.; drlg. sh. 7,034 ft.
Shell Pet. Corp. No. 1 Steinhagan, Wm. Carr Sur. T.D. 7,720 ft.; made sqze. job; P.B. 7,718 ft.; swbg.

Clam Lake—Jefferson County

Shell Pet. Corp. No. 2 McFaddin-State, W. P. H. McFaddin Sur., Sec. 22. Drlg. sh.&L. 1,785 ft.

La Belle—Jefferson County

Sun Oil Co. No. 5 Broussard-Hebert, T. &N.O. Sur. No. 207. 18⅝-in. csg. 130 ft. drlg. sd.&L. 5,304 ft.

Esperson—Liberty County

General Crude Oil Co. No. 2-B Esperson, A. McNeil Sur. 10¾-in. csg. 1,396 ft.

Hardin—Liberty County

J. W. Frazier No. 3 Lynott & Buffam, H. B. Johnston Sur. Drlg. sh. 1,839 ft.
Ark. Fuel Oil Co. No. 1 Cessna, A. B. Hardin Sur. Drlg. sh. 3,937 ft.
Gulf Oil Corp. No. 4 Cessna, H. B. Johnston Sur. R.U.
Humble O. & R. Co. No. 11-A Partlow, H. B. Johnston Sur. Drlg. sh. 1,869 ft.
Texas Co. No. 2 Smith, A. A. Hardin Sur. Drlg. sh. 7,170 ft.

Orange—Orange County

Gulf Oil Corp. No. 2-D Chesson, Wm. Dyson Sur. Spd.
Gulf Oil Corp. No. 10-A Winfree, Wm. Dyson Sur. Loc.
John Mayo No. 1 M. J. Williams, Dyson Sur. R.U.
Union Prod. Co. No. 5 Lutcher Moore, J. Dyson Sur. Drlg. sh. 6,756 ft.

Port Neches—Orange County

Texas Co. No. 14 H. J. Kuhn, Mary E. Hall Sur. Driving piling.

Ace—Polk County

Dick Schwab No. 1-C Kirby-West Lbr. Co., G. A. Thomas Sur. Loc.
Shell Pet. Corp. No. 1 Doucett, P. A. Sublett Sur. T.D. 8,555 ft.; W.O.C.
Shell Pet. Corp. No. 2 Doucett, P. A. Sublett Sur. Loc.

Segno—Polk County

Gulf Oil Corp. No. 4 Quinn, A. Morales Sur. R.U.
Gulf Oil Corp. No. 1 Ragan, I.&G.N. Sur. No. 15. R.U.
Gulf Oil Corp. No. 5 Ragan, I.&G.N. Sur. No. 15. Loc.
Gulf Oil Corp. No. 16 Wing, I.&G.N. Sur. No. 14. Drlg. sh. 7,856 ft.
Gulf Oil Corp. No. 18 Wing, I.&G.N. Sur. Drlg. sh. 4,939 ft.
Humble O. & R. Co. No. 11-BX Kirby, M. Victor Sur. T.D. 8,205 ft.; P.B. 8,187 ft.; tstg.

Spurger—Tyler County

Republic Prod. Co. No. 19 fee, N. Hurd Lge. Drlg. sh. 6,439 ft.

Katy—Waller County

Magnolia Pet. Co. No. 1 Allsup, E. B. Conch Sur., Sec. 108. Drlg. sd.&sh. 2,439 ft.

GULF COAST WILDCATS

Brazoria County

Crosby Drlg. Co. No. 1 Geo. S. Wilson, A. C. Reynolds Sur. 10¾-in. csg. 2,925 ft.; T.D. 9,504 ft.; 7-in. csg. on bttm.; perf. csg. 9,463-69 ft.; flwd. S.W.; ¾-in. csg. ck.; W.O.
Fabriguze et al No. 1 Freeport Sulphur, Stephen F. Austin Sur. (Bryan Mound). M.I.M.
Hamman Explin. Co. No. 1 Darrington, Achilles McFarland Sur. 10¾-in. csg. 1,200 ft.; drlg. sh. 8,026 ft.
Housh & Thompson No. 1 Lula Allen, Kate Ehrmann Sur. Drlg. sdy. sh. 4,376 ft.

Chambers County

Geo. Anderson No. 1 Julia Casey, W. D. Smith Sur. Loc.
Housh & Thompson No. 1 Robbins, Edw. T. Branch Sur. Loc.
L. D. Roberts No. 1 C. H. Lang, T.&N. O. Sur. No. 35. Drk.; (cor.).

Harris County

H. C. Cockburn No. 1 Lena Griffith, Adam Sur. T.D. 4,139 ft.; abd.
Sam Harrison No. 1 Minnetex Co., Wm Lovett Sur. T.D. 6,400 ft.; prep. to abd.
H. H. Givens No. 2 F. K. Adone, David Middleton Sur. Drk.
Midwest Royalty Co. No. 1 Westmoreland Farms, Lot 12, Blk. 39, James Wells Sur. Drlg. sh. 6,567 ft.
J. H. Woodard, Jr., No. 1 Miller Est., John Skorupski Sur. Loc.
Texas Gulf Prod. Co. No. 1 Weary, C Lot 2, E. Fareas Sur. 10¾-in. csg. 996 ft.

Jefferson County

I. E. Harwell No. 1 State, Gulf of Mexico. T.D. 5,840 ft.; D.S. stk.; pulled in two; S.D.
Hebert & Smith No. 1 Stella Turner, J. Gerish Sur. Drlg. sh. 5,932 ft.
Humble O. & R. Co. No. 13-B McFaddin-State, Sec. 8. 10¾-in. csg. 2,758 ft.; T.D. 5,859 ft.; D.S. stk.; backed off at 3,688 ft.; P.B. 4,220 ft.; sdtrkd.; T.D. 6,014 ft.; sdtrkd.; T.D. 6,115 ft.; P.B.; sdtrkd.; 7-in. csg. 5,919 ft.; T.D. 6,572

New MAC
PLUNGER BARREL
for 2-inch tubing

Outlasts three ordinary barrels, as Steel Plunger works in and out of Cast Iron Barrel as much as 2 feet on the up and down stroke and more if desired, thus flushing itself free of sand or gypsum.

Reversible Valve Body and Plunger make for lowest upkeep.

Furnished with 2-Cup Standing Valve and with, or without, Garbutt Rod.

Save, with the New "MAC"!

Ask for complete details and price list.

McGREGOR
WORKING BARREL COMPANY
Bradford, Pa., U.S.A.

ft.; heaving sh.; rmd. to 6,328 ft.; rng. D.P.

Matagorda County

Maja Oil Co. No. 1 Robbins, A. Sheppard Sur. R.U.

Pierce Est. No. 1-P fee, B. J. Rawls & O. Stout Sur. Drlg. sh. 7,315 ft.

Sun Oil Co. No. 1 Cavallin, Theo. F. Koch subd., John Duncan Sur. 9⅝-in. csg. 8,502 ft.; T. gas sd. 9,313 ft.; T.D. 9,582 ft.; 7-in. csg. 9,582 ft.; perf. csg. 9,300-18 ft.; flwg. gas, mud, and S.W.; ¼-in. ck.; T.P. 2,200 lbs.; C.P. 1,950 lbs.; killed; reperf. csg. 8,940-65 ft.; C.O.; showing wash wtr.; ⅛-in. ck.; flwd. 150 B.F.P.D., 75% S.W., 25% dist.; 11/64-in. ck.; T.P. 3,800 lbs.; C.P. 3,900 lbs.

Montgomery County

Deep South Pet. Co. No. 1-A Foster Lbr. Co., Pryor Bryan Sur. Loc.

O. C. Garvey et al No. 1 Foster Lbr. Co., Neil Martin Sur. R.U.

Housh & Thompson No. 1 Graham M. Corner Sur. T.D. 4,820 ft.; prep. to abd.

H. A. Pennington et al No. 1 F. L. Banker, L. M. H. Washington Sur S.D. 1,033 ft.

J. Smith et al No. 1 J. V. Scott. F A B. Wheeler Sur. T.D. 3,742 ft.; abd.

Newton County

Sun Oil Co. No. 1 Peavy-Moore Lbr. Co T.&N.O.R.R. Sur. T.D. 7,700 ft. (cor.); P.B. 7,010 ft.; to sdtrk.

San Jacinto County

J. W. Frazier No. 1 Annie Smith, J. D Martinez Sur. No. 10, Loc.

Carl Keels et al No. 1 Ed Mays, Lot 7, R. O. Lusk Sur. Loc.

Tyler County

J. C. Bonham No. 1 Kountze, F. M. Mc Reynolds Sur. S.D. 2,000 ft.

Washington County

Mount Selman Oil Co. No. 1 Fritz Fuelberg, John Lightfoot Sur. R.U.

Wharton County

Humble O. & R. Co. No. 1 J. D. Ecker Beaty Seale & Forwood Sur. Drlg. sh. 5,854 ft.

Magnolia Pet. Co. No. 1 Borden, Henry Griffith Lge. Loc.

S. W. TEXAS WILDCATS

Bee County

Dirks Bros. No. 1 Page, Thos. K. Pilkington Sur. Loc.

Humble O. & R. Co. No. 1 Fox, Michael Fox Sur. Drlg. sh. 3,246 ft.

Magnolia Pet. Co. No. 1 McKinney Est., L. C. Randolph Sur. Drlg. sh. 1,037 ft.

Bell County

M. M. Gordon No. 1 Steele, Oliver T Tyler Sur. S.D. 1,201 ft.

G. P. Shelton et al No. 1 Nelson, Michael Griffin Sur. S.D. 1,208 ft.

Bexar County

Fred Beatty No. 1 Joppich, Iginio Tejado Sur. No. 186. 6⅝-in. csg. 575 ft., drlg. 1,086 ft.

H. G. Krumm No. 1 Kempf, Samuel Mc Collough, Jr., Sur. 54. T.D. 770 ft., tstg. on pmp.; pmpg. small amt. oil.

L. L. Skaggs No. 1 Braubach, Fernando Rodriquez Sur. S.D. 325 ft.

Blanco County

H. C. McCart No. 1 Geo. Lester, Newton Carson Sur. No. 34. S.D. 40 ft.

Brooks County

Humble O. & R. Co. No. 5 McGill Bros. La Bianca gr. D.S.T. 6,099-6,107 ft.; rec. 550 ft. oil; 75 lbs. press.; T.D. 6,402 ft.; W.O.C.; 5½-in. csg. 6,274 ft.; perf. csg. 6,103-08 ft.; flwg. 27 B.O.; P.D. 9/64-in. ck.

Humble O. & R. Co. No. 7 McGill Bros., Ygnacio Rivas Sur. Drlg. sh. 730 ft.

Caldwell County

Ben H. Fuchs No. 1 Chamberlain, Jos. Burleson Sur. S.D. 834 ft.

Calhoun County

Continental Oil Co. No. 1 J. J. Welder Eusebio Hidalgo gr. Drlg. sh. 4,562 ft.

De Witt County

Richardson et al No. 1 W. D. McCurdy John Hunt Sur. T.D. 150 ft.

Duval County

Ark. Fuel Oil Co. and Taylor Ref. Co. No. 1 Parr, Pedro Saen Sur. No. 12. Drlg. sh. 4,914 ft.

W. L. Catlin et al No. 1 Louis Escapule. J. Poitevent Sur. No. 73. Loc.

Lee Corkill et al No. 1 P. Benavides, Sec. 30, R.U.

Sam Evans No. 1 W. R. Peters, C.C.D. Co. Sur. No. 66. M.I.R.

G. C. Glasscock No. 1 Nicholas Garcia, Santa Cruz De Concepcion gr. S.D. 4,039 ft.; abd.

Frank Gravis No. 3 Schallert, Seale, Morris & Seale Sur. No. 2550. T.D 3,168 ft.; P.B. 1,800 ft.; sdtrkd.; drld. into old hole 2,000 ft.; T.D. 3,168 ft.; set plug; W.O.C.; drlg. sh. 2,212 ft. in sdtrkd. hole.

Henderson Coquat et al No. 1 Southland Life Ins. Co., Sec. 7, Ball Ranch subd., Santos Flores gr. T.D. 5,298 ft.; run csg.; rec. 1,500 ft. P.L.O.; D.S.T. 5,275-98 ft.

H. H. Howell No. 1 Atlee Parr, San Andres gr. R.U.

Luling O. & G. Co. No. 1 Pope Dimitt, Jose Marcelo Ynojosa gr. 10-in. csg. 561 ft.; drlg. sdy. sh. 5,552 ft.

Magnolia Pet. Co. No. 1 Denman, Santos Garcia gr. Drlg. sh. 3,517 ft.

Republic Prod. Co. No. 1 Society for the Propagation of Faith, Julian Reyes Sur. Drlg. sh. 3,717 ft.

Rutland Oil Co. No. 1 Atlee Parr, San Andres gr. Drlg. sh. 212 ft.

Texas Gulf Prod. Co. No. 1 John Dunn, Diego Ynojosa gr. Drlg. sh. 3,158 ft.

Texas Inland Corp. No. 1 Alice Adami, J. H. Gibson Sur. No. 341. T.D. 1,307 ft.; abd.

W. A. Wagner No. 1 D. J. Weikel, John H. Gibson Sur. No. 497. R.U. and S.D.

Goliad County

Cron & Gracey et al No. 1 O. G. Dreier, B.S.&F. Sur. No. 7. Drlg. sh. 750 ft.

Eltoblit Oil Co. No. 1 Pettus, Maria De Jesus Yvarvo Sur. T.D. 8,606 ft.; abd.

Gonzales County

Otton Elder No. 1 Wilkinson, Russell Ward Sur. S.D. 396 ft.

H. F. Hinds No. 1 Dubose, E. G. Coffman Sur. 10-in. csg. 37 ft.; T.D. 2,696 ft.

Guadalupe County

Burton Garvin & Womack No. 1 E. J. Kendall, E. de Los Santos Coy Sur. S.D. 510 ft.

Frank H. Glenn No. 2 Appling, Harriet Cottle Sur. No. 14. T.D. 2,352 ft., L.; W. O.C.

John Hueners No. 1 Boecker, John Baker Sur. No. 26. S.D. 915 ft.

Hidalgo County

Rowan & Hope No. 1 Antonio Bazan, San Ramon gr., Juan Faris Sur. No. 4. Drlg. sh. 2,109 ft.

Jim Hogg County

A. W. Dillard No. 1 Julian Ramirez, John S. Williams Sur. S.D. 3,010 ft.

Humble O. & R. Co. No. 9 Bass, San Raphael gr. Loc.

Humble O. & R. Co. No. 1 Mestena O. & G. Co., Fowler & Rankin subd., Pallos Bianco gr., R. G. Sars Sur. 16-in. csg. 70 ft.; T.D. 2,007 ft.; 10¾-in. csg. 1,563 ft.; D.S.T. 5,096-5,116 ft.; drlg. sdy. sh. 7,020 ft.; S.G.

Imperial Oil Co. No. 1 Jose M. Gutierrez, H. Rodriquez Sur. No. 142. 10-in. csg. 40 ft.

Johnson & Robinson No. 1 Palacios. Mary Montgomery Sur. S.D. 2,550 ft.

Neal and Shaw No. 1 Armstrong, Hooper & Wade Sur. Drlg. sd. 725 ft.

Jim Wells County

F. A. Gillespie & Sons No. 1 Shear, Blk. 24, Adam Beatty & Moulton Sur. 10¾-in. csg. 999 ft.; S.D. 6,590 ft.; P.B. 5,470 ft.; rmg. hole to make D.S.T.

Tom Graham No. 1 N. O. Adams, Macellino Lopez gr. T.D. 5,850 ft.; 5½-in. csg. 5,020 ft.; showed S.W.; sqzd. 4,928-38 ft.; perf. csg. 4,926-33 ft.; jetted S.W. with S.O.; abd.

Tom Graham No. 1 Zappe, Lavaca gr. Loc.

Gravis & Doran No. 1 Lillian Mull, J. Poitevent Sur. 10¾-in. csg. 595 ft.; drlg. sh. 2,557 ft.

Ike Howeth No. 1 O. S. Adams, Sec. 122, Wm. Adams Sur. Drlg. sh. 4,310 ft.

Parr Drlg. Co. No. 1 W. K. Hoffman, LaVaca gr., Sec. 8. R.U.

W. R. Quinn et al No. 1 D. M. and Fritz Pundt, T. C. Wright Sur. Bldg. drk.

Sheli Pet. Corp. No. 1 2 Von Blucher, Lucinda Best Sur. Drlg. sh. 5,124 ft.

Texas Gulf Prod. Co. No. 1 A. M. Perez, La Tinaja de Lara gr. Drlg. sh. 4,090 ft.

R. S. Weldron et al No. 1 C. B. and Peck Welhausen, Geo. Rounds Sur. Drk.

Kenedy County

Humble O. & R. Co. No. 1 Kenedy rnh., Penaseal gr. Cg. sh. 7,089 ft.

Lee County

Fred Pederson et al No. 1 Brown, David Hudson Sur. T.D. 6,404 ft.; acd.; R.U.; pmpd. 100 bbls. fluid; 36 hrs.; 3 bbls. oily emulsion, bal. S.W.; dpnd. to T.D. 6,424 ft.; hung tbg. at 6,400 ft.; S.I.; showing 250 lbs. pres. on csg.

Live Oak County

Walter Nelson et al No. 1 Paul Zomzow, R. Triplet Sur. No. 152. Drlg. sh. 30 ft.

Cities Service Oil Co. No. 1 McCaslin, Henry C. Jackson Sur. T.D. 4,603 ft.; fsg.

L. W. Stieren No. 3 Lange, Thos. Adams Sur. T.D. 1,497 ft.

McMullen County

Mid-Western Pet. Corp. No. 1 C. E. Byrne, Geo. Pittuck Sur. S.D. 1,250 ft.

C. D. Scarborough and Bigiane No. 1 Paul Foyt, James Garner Sur. No. 6. S.D. 1,228 ft.; 7-in. csg., 1,251 ft.

Shumway & Burns No. 4 Shiner, Sec. 39 of Shumway subd. of Shiner ranch. R.U.

R. M. Strum and Womack No. 1 Smith and Leischner, A. Zumwalt Sur. S.D. 1,532 ft.

Medina County

F. J. Carle No. 1 Tom J. Bendale, J. Barnhart Sur. No. 593. S.D. 770 ft.

J. I. and J. W. Cromwell No. 1 Tschirhart, I. J. Rogers Sur. No. 18. Drlg. L. 855 ft.

Victor Ziegler No. 1 Paul Haby, Wm. G. Still Sur. No. 1. S.D. 1,000 ft.

Nueces County

H. D. & H. Oil Co. No. 1 Wright, V. L. De Herrera gr. S.D. 5,890 ft.

O. W. Killam et al No. 1 F. J. Smith, E. L. Rincon de Corpus Christi gr., Sec. 30. Spd.

Shell Pet. Corp. No. 1 Griffith, Vicente Lopez de Herrera gr. T.D. 7,510 ft.

Refugio County

Quintana Pet. Corp. No. 3-B O'Connor, Timothy Hoyt Sur., 5,800 ft. S of Mellon Creek field. Drlg. sh. 5,439 ft.

Royal O. & G. Corp. et al No. 1 M. L. Oppenheimer, Antonio De la Vina Sur. (Bonnieview field). T.D. 6,505 ft.; 5½-in. csg. 4,301 ft.; perf. csg. 4,240-43 ft.; rec. 200 ft. S.W.; 800 lbs. W.P.

San Patricio County

Paul Benedum et al No. 1 Phillips, Elbert G. Head Sur. (1 mi. N of East White Point field). Drlg. sh. 2,637 ft.

Smith O. Morgan No. 1 H., S. J. Pollan Sur. T.D. 5,265 ft.; P.B. 5,088 ft.; to sdtrk.

Starr County

C. L. Foster No. 1 H. Garza, Juan Salinas Porc. No. 71. R.U.

Magnolia Pet. Co. No. 3 M. M. Garcia, S. Vela Porc. No. 90. T.D. 6,104 ft.; well tried to blowout; S.D.

Rhinehart and Bowman No. 1 Bowman. J. C. McCarthy Sur. Loc. abd.

Sun Oil Co. No. 1 C. H. Speer, C.C.S.D.& R.G.N.G. Sur. T.D. 5,188 ft.; 7-in. csg. 5,188 ft.; perf. csg. 4,996-72 ft.

W. W. Zimmerman No. 2 M. S. Tijerina, H.E.&W.T.R.R. Sur. No. 299. T.D. 1,374 ft.

Travis County

E. A. Fields and M. T. Paine No. 1 Pete Carlson, Robt. Fletcher Sur. No. 69. S.D. 1,050 ft.

Jackson & Zixinia No. 1 Carlson, Wm. Cardwell Sur. No. 66. S.D. 750 ft.

Oscar Raesz et al No. 1 J. W. Swahn, Phillips McElroy Sur. No. 16. S.D.; L. 558 ft.

Webb County

Brazos Young Corp. No. 1 A. M. Bruni, J. Borego gr. T.D. 4,305 ft.; abd.

Gilcrease Oil Co. No. 1 W. E. Trafton, J. Poitevent Sur. No. 281. Drlg. sh. 1,876 ft.

J. M. Hardie No. 1 J. M. Garcia, Blk. 27 of Hughes Pet. Co. Mineral subd., Los Ojuelos. 5½-in. csg. 1,840 ft.; T.D. 1,848½ ft.; swbd. dry.

A. E. Heniger No. 1 M. Guerra, Juan P. Yzaguirre Porc. No. 56. T.D. 1,205 ft.; abd.

Johnson and Robinson No. 1 Mabel Adami, A.B.&M. Sur. No. 35. S.D. 450 ft.

Navarro Oil Co. No. 1 Rosa V. Benavides, Josefa Cuellar gr. Drlg. sh. 1,778 ft.

Rodney DeLange No. 1 Garcia, S.M.&S. Sur. No. 337. R.U.

Smith & Storey No. 1 Houston Oil Co., R. O. Barnsley Sur. No. 24. T.D. 2,445 ft.; 5½-in. csg. 1,830 ft.; perf. csg. 1,834-65 ft.; S.D.

Willacy County

Cockburn et al No. 1 Yturria Ld. Livestock Co., San Juan de Carricitos gr. 10¾-in. csg. 1,228 ft.; cg. oil sd. 4,857-67 ft.; D.S.T. rec. 60 ft. oily mud; T. D. 7,684 ft.; S.D.

Williamson County

W. O. Caffey No. 1 J. Seggern, Hardy Pace Sur. S.D. 451 ft.

Fritz Fuchs No. 1 Adolph Schultz, Jefferson West Sur. Drlg. sh. 1,628 ft.

EAST TEXAS

(Border Counties)

Harrison County

Ark.-La. Gas Co. No. 1 Jim Davis, James Adams Sur. Drlg. anhy.&sh. 4,675 ft.

Wm. S. King No. 1 Taylor, H. Martin Sur. Cg. sh. 3,667 ft.

Marion County—Rodessa

Ark. La. Gas Co. No. 1 Hurst, A. D. S. Coy Sur. Drlg. sh. 4,172 ft.

Cable Tool Drlg. Co. No. 1 Jackson, John Hanks Sur. Set 5½-in. csg. 6,063 ft.; tstg. 6,089 ft.

Marion County—Other

Tom Bell No. 1 Moseley, D. Lane Sur. T.D. 2,596 ft.; S.D.

Exploroil Co., Inc., No. 1 Susie Chatten, I. N. Jones Sur. Nac. sd. 1,186-94 ft.; S.D. 2,682 ft.; W.O.

H. A. Vestal et al No. 1 Terry, Gaines Coor Sur. S.D. 1,160 ft.

Panola County

Paul Pewitt No. 1 Rushing Est., Mannon Smith Sur. Skdd. drk. 150 ft. S; R.U.

Shelby County

Earl McDaniel No. 1 C. W. McDaniel, Wm. Snider Sur. Cg. 5,211 ft.

WEST TEXAS WILDCATS

Andrews County

J. W. Tripplehorn No. 1 M. A. Thornberry, Sec. 2, Blk. 42-A. S.D. 4,480 ft.

Brewster County

H. D. Wilcox No. 2 Kokernot. Sec. 23, Blk. C, J. V. Massey Sur. Drlg. 545 ft.

Cochran County

T. G. Shaw, Tr., No. 1 Carrie S. Dean, Lge. 94. Swbg. 12 B.F.P.H., 4,981 ft.; prep. to D.D. 4,982 ft.

Concho County

Clymore Co., Inc., No. 1 Hill, J. Frederick Sur. No. 1694. Trying to free 7-in. 1,960 ft.

Crane County

P. A. Christian No. 1 M. F. Stephenson, Cert. 2044, W. H. Bates Sur. No. 40. C.&P.

Gulf Oil Corp. No. 5 M. B. McKnight, Sec. 1, Blk. 21-B. P.S.L. Sur. Drlg. 3,440 ft.; est. 51 B.O.P.D.

Magnolia Pet. Co. No. 12 W. P. Edwards, Sec. 12, Blk. 23-B, P.S.L. Sur. S.D. 3,529 ft.; pmp. 40 B.O. in 24 hrs. comp.; 47 B.O.P.D.; 3,529 ft.

Crockett County

Hanson & Anderson No. 1 W. T. Knoelke, Sec. 30, Blk. GG, H.E.&W.T. Sur. Spd. and S.D.

Humble No. 1 Ozona-Barnhart, Sec. 4, Blk. M-N, G.S.&F. Sur. Drlg. 6,450 ft.

Crosby County

Gulf Oil Corp. No. 1-C Swenson, Sec. 95, Blk. 2, H.&G.N. Sur. Drk.

Culberson County

Harry Niehaus No. 1 Caldwell, Blk. 109, Sec. 13, P.S.L. Sur. D.&A. 5,008 ft.

Quito Oil Co. No. 1 Cameron Lbr. Co., Sec. 24, Blk. 81, P.S.L. Sur. S.D.R. 945 ft.

Dawson County

Daw-Tex Oil No. 1 J. E. Neely, Sec. 28, Blk. 35, T.&P. Sur. Cmtd. 7-in. 4,369 ft.; pulling collapsed 7-in. at 4,450 ft.; W.O.C. 3,751 ft.; cmtd. whpstk.; rng. 7-in. 4,210 ft.

Dickens County

Bond D. Jones No. 1 Ford et al, I.&G.N. Sur. S.D.O. 3,662 ft.

Humble O. & R. Co. No. 1 Matador Ld. & Cattle Co., Sec. 26, Blk. 1, Shock & Arnold Sur. W.O.C. 6,945 ft.

Ector County

M. B. K. Drlg. Co. No. 2 Gist, Sec. 9, Blk. 42, T.&P. Sur. Drlg. 1,600 ft.

El Paso County

Tri-State Oil Co. No. 1 Kinkel. S.D. 3,571 ft.

Gaines County

Osage Drlg. Co. No. 1 E. H. Jones, Sec. 20, Blk. 7-A, P.S.L. Sur. S.D.; csg. 4,800 ft.

Glasscock County

B. A. Duffy No. 1 Carter-Shell, Sec. 8, Blk. 33, T.&P. Sur. D.&A. 2,707 ft.

J. R. Petty No. 1 Joe Blake, Sec. 163, Blk. 29, W.&N.W. Sur. U.R. 690 ft.; T.D. 727 ft.; lowering 7-in. 870 ft.

Hockley County

Texas Co. No. 1-C Mallett, Lbr. 11, Lge. 51, Scurry C.S.L. Sur. D.P. stk. 1,500 ft.; T.D. 4,575 ft.

Howard County

A. Delcambre, Jr., No. 1 M. H. O'Daniels, Sec. 39, Blk. 30, T.&P. Sur. Abd. loc.

Dick Graham No. 1 P. Johnson, Sec. 34, Blk. 32, T.&P. Sur. Loc.

Ooley & McQuain No. 1 O'Daniels, Sec. 39, Blk. 30, T.&P. Sur. Drlg. 2,270 ft.

Hudspeth County

Haymon Kroupp Oil & Ld. Co. No. 1 Thaxton, SE¼ Sec. 34, Blk. 74, Twp. 6. Drlg. 6,124 ft.; G.S. 6,091-92 ft.

Haymon Krupp No. 1 Briggs, Sec. 24, Blk. 73, Twp. 7, T.&P. Sur. W.O.C. 5,365 ft.

Irion County

J. W. Ellis No. 1 Sol Mayer, Sec. 240; Blk. 1, T.&P. Sur.; 2,100-ft. test. Lost hole, skidded 10 ft. east; S.D.; csg. 1,931 ft.

Lynn County

John L. Baldridge No. 1 Alma Lbr. Co., Sec. 151, H.E.&W.T. Sur. W.O.C. 4,450 ft.

Martin County

T. G. Shaw, Tr., No. 1 Wilkerson, Sec. 35-A, B.&C. Sur. Prep. D.D. 3,468 ft.

Pecos County

Geo. T. Abell No. 1 T. A. Knapp, Sec. 22, Blk. 9, H.&G.N. Sur. Drlg. 485 ft.

Ben Dansby No. 1 L. C. Lessenich, Sec. 45, Blk. 9, H.&G.N. Sur. S.D.O. 2,370 ft.

Leidecker & Cain No. 1 M. M. Lehn, Sec. 71, Blk. 10, H.&G.N. Sur. Drlg. 1,120 ft.

Magnolia Pet. Co. No. 1 Eaton-Abell, Sec. 23, Blk. 3, H.&T.C. Sur. C.&P.

O. E. Schade No. 1 Otis Garrett, Sec. 59½, Blk. 8, H.&G.N. Sur. C.O. 2,290 ft.; S.O.

Thomason Prod. Co. No. 1 Notions, Sec. 1, Blk. 105, W. P. Howard Sur. U.R. 7-in. 1,980 ft.

S. Thompson No. 1 Elsinore Cattle Co., Sec. 54, Blk. D, G.C.&S.F. Sur. Rig burned; dropped bailer in hole; S.D.O. 7,342 ft.

J. C. Trees No. 1 fee, Sec. 63, Blk. 3, H.&G.N. Sur. C.O. 2,314 ft.

C. W. Williams No. 1 J. Eaton, Sec. 1, Blk. 203, J. H. Handy Sur. Drlg. 145 ft.

C. W. Williams No. 1 T.&P. Ld., Sec. 95, Blk. 3, T.&P. Sur. Loc.

Reeves County

Artie Baker No. 1 J. W. Grider, Sec. 31, Blk. 58, P.S.L. Sur. S.D.R. 450 ft.

Schleicher County

Lone Star Gas Co. No. 1 Bert Page, Sec. 30, Blk. L, G.H.&S.A. Sur. Cmt. cave 4,922 ft.

Lone Star Gasoline Co. No. 2 Bert Page, Sec. 46, Blk. L, G.H.&S.A. Sur. Drlg. 3,660 ft.

Scurry County

Coffield & Guthrie No. 1 First Natl. Bk. Snyder, Sec. 29, Blk. 97, H.&T.C. Sur. Prep. shoot 3,184 ft.; O.S.

Stonewall County

Forest Dev. Co. No. 1 T. A. Ellison, Blk. D, Sec. 114, H.&T.C. Sur. C.&P.
Shell Pet. Corp. No. 1 T. K. Smith, Sec. 143, Blk. 1, H.&T.C. Sur. Loc.

Tom Green County

Lynn & Cobb No. 1 I. B. Cox, Val. Mueller Sur. No. 176. Drlg. 100 ft.
Roush & Steward No. 1 Pugh, James Eldridge Sur. No. 73. Drlg. 75 ft.
Dan Short et al No. 1 J. G. Davidson NW part of Lovie P. Moore Sur. Drlg. 150 ft.
Southern Cross No. 1 Upton & Upton, Sec. 20, Blk. A, A.B.&M. Sur. Drlg. 2,387 ft.
Spinner No. 1 Reed, Mason Ferry Ranch Sur. S.D.O. 5,803 ft.
Tom Green Oil Co. No. 1 Schreiber, A. Krending Sur. 1663, S.D.O. 2,042 ft.

Upton County

White & Wilson No. 1 Webb, Sec. 17, Blk. 1, C.C.S.D.&R.G.N.G. Sur. S.D.R. 2,800 ft.

Ward County

McQueen & Clevenger No. 1 Geo. Sealy Sec. 47, Blk. F, G.M.M.B.&A. Sur. W.O. tools; prep. D.D. 2,905 ft.
Peerless O. & G. Co. No. 1 Texas Cotton Ind., Sec. 35, Blk. 1, H.&T.C. Sur. R.U.S.
Geo. Wallace No. 1 R. Avery, Sec. 36, Blk. 1, H.&T.C. Sur. S.D.R. 40 ft.

Winkler County

Harding & Margan No. 1 Jenkins-Gulf, Sec. 13, Blk. 77, P.S.L. Sur. Drlg. 1,770 ft.
Standard Oil, Texas, No. 2 Baird, Sec. 13, Blk. 3-B, P.S.L. Sur. C.O. 3,357 ft.; flwd. 66 B.O. in 16 hrs.; tstg.

Yoakum County

Osage Drlg. Co. No. 1 Miller, Sec. 89, Gibson Sur. Treating 5,106 ft.; comp.; 145 B.O.P.D.
Shell Pet. Corp. No. 1 J. M. Rutts, Sec. 743, P.B. 5,229 ft.; comp. 161 B.O.P.D
Shell Pet. No. 1 Waples-Platter, Sec. 616. Drlg. 5,223 ft.
T. & P. Oil Co. No. 1 A. M. Brownfield, Sec. 802. Prep. C.O. 5,056-5,125 ft.; flwd. est. 50 bbls.; swbg. and C.O. 5,-151 ft.; comp.; 928 B.O.P.D.

TEXAS PANHANDLE

Collingsworth County

C. H. Mee and C. F. Anderson No. 1 V. K. McCaskill, Sec. 18, Blk. 16, H.&G. N. Sur. Drlg. 2,414 ft.
Johnson No. 1 Taylor. S.D. 875 ft.

Deaf Smith County

Uscan No. 1 Farwell. S.D. 5,650 ft.

Donley County

Robinson No. 1 Kuteman, Sec. 88, Blk. 20, H.&G.N. Sur. D.&A. 4,406 ft.

Gray County

Products O. & G. Co. No. 1 Mason Davis, Sec. 23, Blk. 23-M, H.&G.N. Sur. Loc.
Trippiehorn No. 2 Webb, Sec. 12, Blk. A-9, H.&G.N. Sur. Cl. out 2,665 ft.; comp. 37 B.O.P.D.

Lipscomb County

Darrouzett Oil Co. No. 1 Pugh, 1½ mi. S and 1 mi. W of Darrouzette. S.D.; wtr. 3,401 ft.

Roberts County

Whitlock No. 1 Cunningham. Drlg. 4,287 ft.

E. C. TEXAS WILDCATS

Anderson County

Mayo & Cook No. 1 So. Pine Lbr. Co., R. Erwin Sur., 2 mi. W of Slocum. Cg. 5,185 ft.

Angelina County

K. L. McHenry No. 1 J. S. Russell, A. Flores Sur., 4 mi. N of Lufkin. Tstg. 1,032 ft.

Cherokee County

C. C. Lanier No. 1 A. T. O'Neal, J. M. Procella Sur., 3 mi. E of Troup. S.D.; D.&A. 3,910 ft.

Falls County

M. A. Hayes No. 1 D. G. Wooten, J. Powell Sur., 8 mi. SE of Zott. Prep. D.D. 18 ft.

Grayson County

John Grey No. 1 Freedman, W. C. Reeves Sur., 8 mi. NW Denison. U.R. 743 ft.
Jim McMurrey No. 1 Dr. T. J. Long, J. Garland Sur., 2 mi. S of Collinsville, 4,000-ft. test. S.D.O. 3,929 ft.
Ross & Marshall No. 1 J. N. Taylor, W. Moore Sur., 8½ mi. NW of Denison. S.D. 918 ft.

Hill County

Sykes-Brennals No. 1 Weatherly, W. O. Nerriweather Sur., 4 mi. SE of Hillsboro. M.I.M.

Houston County

Cities Service Oil No. 1 C. C. Hill, J. D. Procella Sur., 2 mi. W of Grapeland. Drlg. 3,975 ft.
G. C. Dixon No. 1 W. Goodman, J. J. Thomas Sur., ¾ mi. E of Lovelady. Loc.

Kaufman County

Sam Knoerr No. 1 J. B. Hunter, P. Walker Sur., 5 mi. S of Terrell. Drlg. 1,845 ft.
W. G. McGee No. 1 General American Life Ins. Co., John Baker Sur., 6 mi. W of Mabank. S.D.; W.O. 3,093 ft.; T. S. 3,070 ft.; S.O.

Leon County

Humble O. & R. Co. No. 1 W. O. Harris, T. O. Harris Sur., 4 mi. NW of Navarro Crossing; offset to No. 1 Ed Swift. Loc.
Humble O. & R. Co. No. 1 Ed F. Swift, H. W. Subblett Sur., 4 mi. NW of Navarro Crossing field. Prep. drill plug; O.S. 5,904 ft.; comp.; 105 B.O.P.D.

Limestone County

H. Gant No. 1 Vol De Long, P. Varela Sur., 1½ mi. NW of Thelma. S.D. 2,-975 ft.
H. Richardson No. 1 Banks, B. Davis Sur., 2 mi. NE of Thornton. Cg. 3,-592 ft.
S. A. Thompson No. 1 R. L. Nance, J. D. Brown Sur., 5 mi. SE of Thornton. Drlg. 4,185 ft.

McLennan County

C. E. Porter No. 1 B. D. Burchett, De la Vega Sur., just SE Waco. S.D. 695 ft
J. M. Russell No. 1 Lovelace, P. J. Menard Sur., 5 mi. SW of Waco. S.D. 380 ft.

Nacogdoches County

D. McDaniels No. 1 G. Muckleroy, J. A. Cherino Sur., 2 mi. SE of Cherino. D.&A. 1,002 ft.

Navarro County

Guy Sitton No. 1 J. P. Fortson, T. J. Chambers Sur., 4 mi. E of Alma. S.D. 628 ft.
W. H. Strong No. 1 Emma Jackson, J. McNeal Sur., 10 mi. S of Corsicana. S.D. 628 ft.

Rains County

McKinley & Hastings No. 1 McTaggert. B. Milder Sur., 1 mi. W of Emory. S.D. 720 ft.

Red River County

Daniels No. 1 J. J. Gaston, Joseph Guest Sur., 2 mi. S. Detroit. Formerly abd. at 1,109 ft.; D.&A. 1,274 ft.
Hampton, Osteen & Wooley No. 1 J. M. Roberts, J. Ware Sur., 12 mi. N of Clarksville. Loc.

Robertson County

J. E. Cox No. 1 Sandifer, H. Henry Sur., 3½ mi. SE of Franklin. Loc.

Smith County

R. W. Rair No. 1 Clark, J. Lewis Sur., 2 mi. W Mt. Sylvan. D.&A. 5,388 ft.
J. H. Thomason No. 1 J. W. Bartlett, R. H. Stewart Sur., ¼ mi. SE of Jamestown. S.D. 1,869 ft.

Upshur County

Gaskill Oil No. 1 E. E. Arnold, J. Scott Sur., 2 mi. SE of Jamestown. D.&A. 3,693 ft.

Van Zandt County

F. A. Richardson No. 1-A B. C. Dodd, T. W. Hutchinson Sur., 2 mi. S of Grand Saline. S.D. 2,350 ft.

Wood County

Geo. Strake No. 1 Farrier, J. Walker Sur., 4 mi. E of Yantis. T.D. 6,507 ft.; O.S. 3,906-16 ft., 3,930-65 ft.; rng. 5½-in. csg. to test.

NORTH TEXAS WILDCATS

Archer County

British American O. P. Co. No. 1 T. B. Wilson, Sec. 12, H.&T.C. Sur. Drlg. 2,893 ft.
G. E. Kadane & Sons No. 1 J. Hemmi, Sec. 60, Clark & Plumb Sur., Blk. 3, R.U.R.
Phillips Pet Co. No. 1 J. B. Miller, Sec. 20, A.T.N.C.L. Sur. T.D. 4,006 ft.; O. W.D.D.; S.O. to D.D. to 4,500 ft.; C.O. 3,800 ft.
L. Sikes No. 1 Miller, Wm. Shaw Sur. A-378. 6⅝-in. cmtd. 5,218 ft.; drld. plug; tstd. S.W.; S.D.O.

Baylor County

British Am. O. P. Co. No. 1 J. E. Cope, Sec. 220, T.&N.O. Sur. Drlg. 4,910 ft.
British Am. O. P. Co. No. 1 F. C. Green "L," Sec. 8, H.T.&B. Sur. Drlg. 2,605 ft.

Clay County

Bridwell Oil Co. No. 1 Furd Halsell, Blk. 16, W.C.R.R. Sur. Drlg. 4,072 ft.
H. S. Moss No. 1 T. J. Parmley, Sec. 6s, M.G.S.L. Sur. A-308. S.D. 4,055 ft.

Hardeman County

N. Gilbert No. 1 R. Weakley, Sec. 85, H. &T.C. Sur., 4,000-ft. test. Loc.

Cooke County

Means & Howard No. 1 W. T. Lynch, A. Edmiston Sur. A-353. Matl. for 5,-000-ft. test. Drlg. 3,022 ft.
Needham & Richards No. 1 Peary, T. Toby Sur. A-1047. Drlg. 1,678 ft.
Geo. Ross & Co. No. 1 B. Inglish, G. W. McGowan A-695 Sur. 6⅝-in. csg. 1,-609 ft.; S.S.O. 1,678-33 ft.; W.O.C.

Jack County

Buttram Pet. Corp. No. 1 Cullers, Blk. 4, S.P.R.R. Sur. Drlg. 2,010 ft.
Pitzer & West No. 1 F. Warren, Sec. 2784, T.E.&L. Sur. 6⅝ 4,365 ft.; L. 4,365-4,418 ft.; tstg. est. 150 bbls.

Montague County

Benton & Holmes No. 1 J. Bowers, Sec. 55, M.E.P.&P. Sur. S.S.O. 2,887-95 ft.; 6⅝-in. 2,883 ft.; tstg. est. 500 to 600 B.P.D.
Cordova-Union Oil-Gillespie No. 1 Cable, Stephenson Sur., Abst. 462. Loc.
Staley Oil Co. No. 1 Nunnely, M. S. Ussery Sur. A-824. Drlg. 4,035 ft.

Wichita County

F. S. Freeland No. 1 J. D. Cooper, H. Hastie A-92; 4,000-ft. test. Spd. and S.D.

Wise County

H. Jackson No. 1 F. Neeley, Blk. 29, Matagorda Co. Sch. Ld. Spd. and S.D.
H. M. Muse No. 1 F. F. Kaker, Blk. 16, Matagorda Co. Sch. Lds. Pits.

Wilbarger County

Lawson & Leavell No. 16 W. T. Waggoner A. Sec. 109, H.&T.C. Sur., Blk. 14; 3,500-ft. test. Drlg. 1,295 ft.

Young County

G. E. Fagg No. 1 Gretchen Morgan, Sec. 3410, T.E.&L. Sur. Cellar.
H. M. Leidecker No. 1 J. M. Nall, Sec. 1997, T.E.&L. Sur. Rebldg. drk.; T.D. 2,625 ft.
Long & Lupton No. 1 A. Crouch, I.&G. N. Sur. A-1460. 6⅝-in. 3,865 ft.; sat. L. 3,940 ft.; treating with acid; test wtr.; S.D.O.

WEST CENTRAL TEXAS DISTRICT

Brown County

T. W. Allmon No. 1 Almeda Moore, Jesse Williams Sur. No. 144, Abst. 931, Rng. csg. 400 ft.
E. C. Norman No. 1 Stella Rice, Chas. Messenger Sur. No. 127. Tstg. after acd. 997 ft.; est. 12 B.O.P.D.
A. D. Bruce No. 1 L. J. Mauldin, Sec. 15, H.&T.C. Sur. S.D. 520 ft.

Callahan County

Joe Fainer No. 1 M. Guyton, John Barton Sur. No. 8, Abst. 11. S.D.O. 1,-650 ft.
J. C. Jackson and Doug. Tomlingson, Jr., No. 1 T. J. Thompson, Sec. 30, B.B.B. &C. Sur. Drlg. 1,900 ft.
Geo. Nichols No. 1 T. Jackson, Sec. 14, D.&D.A. Sur. Loc.
Pet. Prod. No. 1 J. M. Morrisset, SW¼ Sec. 91, Blk. 13, T.&P. Sur., 5 mi. NW of Clyde. D.&A. 1,763 ft.
Westgate-Greenland Oil Co. No. 1 Chas. Yost, SE¼ Sec. 23, Blk. 8, S.P.R.R. Sur., on Callahan-Taylor County line. D.&A. 2,155 ft.

Coleman County

Dale Smith No. 1 T. M. Hayes, Mund Gross Sur. No. 44. S.D.O. 260 ft.

Comanche County

Comanche O. & G. Co. No. 1 J. E. McGuire, C. Rockefeller Sur. No. 3. S.D. O. 2,910 ft.
E. T. DeArman No. 1 Moorman, Sec. 37, D.&D.A. Sur. Drlg. 2,652 ft.
E. M. Howard No. 1 Union Life Ins., Lampasas C.S.L. Sur. Drlg. 429 ft.

Concho County

National Resources No. 1 Armon, Sec. 105, Blk. 72, T.&N.O. Sur. S.D.R. 493 ft.

Eastland County

G. M. Grace No. 1 J. W. Caudle, W. Mitchell Sur., Abst. 382. Drlg. 625 ft.

Fisher County

J. D. Baker No. 1 O. R. Burnham, Sec. 4, Blk. R, W. D. Richardson Sur. D.& A. 3,214 ft.

Hamilton County

Wallace & Vickers No. 1 C. C. Lund, J. P. Bailey Sur. 51. Drlg. 2,825 ft.

Haskell County

Amerada Pet. Corp. No. 1 Kleiner, J. M. Cass Sur. Drlg. 640 ft.

Jones County

R. B. Carrol No. 1 G. Herndon, Goliad C.S.L. Sur. Tstg.; T.D. 2,883 ft.; S.O.
Ed. L. Evans No. 1 B. J. Crier, Sec. 8, B.A.L. Sur. S.D.O. 1,765 ft.

Nolan County

Green & Owens No. 1 Tipton, Sec. 43, Blk. 19, T.&P. Sur. Tstg. 4,464 ft.

Palo Pinto County

W. K. Gordon No. 1 J. W. Conway, Ruldosa I.R.R. Sur. C.O. 3,515 ft.
P. R. Long No. 1 J. W. Watson, Sec. 13, Blk. 3, T.&P. Sur. Drlg. 1,230 ft.

Shackelford County

J. P. Alexander No. 1 Alexander, Sec. 569, T.E.&L. Sur. S.D.O. 650 ft.
Oconee Oil Co. No. 1 Eli Jennings, Sec. 62, Blk. 14, T.&P. Sur. S.D.R. 550 ft.

Canadian Fields

(Continued from Page 88)

Tests in the Lime

In Section 9-18-2w5, South Turner Valley, D. & D. Oils No. 1, LSD 12, finished at 7,388 feet, showed improved bottom-hole pressure on official tests. Temporary allowable was increased from 138 to 219 bbls. Potential production is around 650 bbls. a day. Farther west, in Section 8-18-2w5, Royalite Oil Co. No. 38 is below 7,127 feet after getting the Madison limestone at 7,041 feet and cementing casing at 7,056 feet.

West of the main field, Okalta Oil Co. No. 6, LSD 3, Section 30-18-2w5, is installing bull wheels for pumping from the upper lime where a fair commercial production is indicated around 9,994 feet.

In North Turner Valley, Royalite Oil Co. No. 35, LSD 7, Section 27-20-3w5, is below 6,862 feet, more than 680 feet in the Madison limestone and will probably be carried another 60 to 100 feet for a conclusive test. Location is southeast of Home Oil Co. No. 2 Millarville, and a little southwest of Royalite No. 29 Turner Basin, LSD 9, same section, which was carried 650 feet in the lime to secure a small natural production, which was increased to large proportions by acidizing.

West Central Turner Valley

In Section 6-19-2w5, West Turner Valley, East Crest Oil Co. No. 4, LSD 8, is in the Dalhousie sand below 7,191 feet. The sand logged approximately 209 feet higher than in Anglo-Canadian No. 1 producer, another outpost well immediately to the south. East Crest No. 4 is regarded as one of the most important tests in the field being located a half mile west and a little south of the nearest producer in Section 5-19-2w5, so that production here will materially extend the proven crude area to the west. It should get the Madison limestone above 7,400 feet.

Ontario Drilling

In Malahide Township, Elgin County, Ontario, Union Gas Co. No. 6, Lot 17, Concession 5, finished a dry hole below 1,400 feet. Union No. 7, Lot 19, Concession 6, drilled into salt water around the same depth, and is being abandoned.

In the Dover field, Kent County, Prairie Oil & Gas Co. No. 7, J. S. Thomas farm, E half Lot 5, Front Concession, Raleigh Township, is making about 50 bbls. a day from the Trenton limestone. Ajax Oil & Gas Co. is preparing to drill a deep test of the Trenton limestone in Dover Township on the north side of the River Thames. George W. Rawlings of Chatham has the contract.

W. H. Stubble of Chatham has the contract for a deep test to be drilled on the English farm in Harwich Township, about 2 miles south of the city of Chatham, and just east of the Harwich-Raleigh Township line.

F. A. Ogletree of Dresden has leased a block of 1,200 acres in Sarnia Township, Lambton County, between Concession 6, Plympton Township, and the London Road, and is planning to drill a deep test for oil. Location will likely be made after a series of shallow tests to determine the structural high. Operations will be started within a couple of weeks.

Warwick Shallow Field

In the Warwick shallow field, Lambton County, Andrew Heal No. 5 on the Sam Birchall farm, Lot 27, Concession 5, Warwick Township, got production in the upper horizon, starting at better than 100 bbls. a day. A test by Jerry Hussey and associates of Petrolia on the Thomas Westgate, Sr., farm, Lot 22, Concession 5, finished with a flush of 125 bbls. a day. A test for the Buhler Syndicate on the Boughner property west of Watford is getting close to the sand. Doug Banks well on the J. Albert Brush farm, Lot 30, Concession 5, which started around 100 bbls. a day is maintaining a good production.

Gulf Coast Fields

(Continued from Page 72)

ada-Stanolind Oil & Gas Co. No. 4 Smith, sand 6,822-53 feet, 149 bbls., eighth-inch choke. Amerada-Stanolind Oil & Gas Co. No. 6 E. M. White, perforated casing 6,842-46 feet, 207 bbls., eighth-inch choke. Sinclair Prairie Oil Co. No. 1 Frazier, 7,121 feet, abandoned. Friendswood field: Humble Oil & Refining Co. No. 15-B Humble-West, sand 5,856-6,040 feet, 624 bbls., quarter-inch choke. Satsuma field: H. E. Williams and others No. 1 Cruice, 7,000 feet, abandoned. Tomball field: Humble Oil and Refining Co. No. 2-A Theis, 5,595 feet, 240 bbls., quarter-inch choke.

Hardin County

Batson field: H. K. Bullock No. 1 F. N. Bullock, 6,007 feet, abandoned. Jordan Drilling Co. No. 2 Marrs-McLean, 5,608 feet, abandoned.

Jefferson County

Lovells Lake field: Humble Oil & Refining Co. No. 1 Pitre, sand 7,715-23 feet, 173 bbls., eighth-inch choke.

Liberty County

Hardin field: Texas Co. No. 2 Smith, perforated casing 7,612-20 feet, 528 bbls., quarter-inch choke.

Wharton County

Louise field: Gulf Stream, Inc., No. 10-A Kountze, sand 5,130-69 feet, 385 bbls., quarter-inch choke. Withers field: Smith & McDannald No. 1 Peter McDannald No. 1 Peter Broussard, 5,547 feet, 104 bbls., eighth-inch choke. Texas Co. No. 5 Broussard, 5,542 feet, 112 bbls., eighth-inch choke.

West Texas Fields

(Continued from Page 68)

Also in Jones County, prospects were again seen for commercial production at a wildcat which has been in the completion stages for several weeks. The well is Ralph R. Carroll No. 1 Herndon, western part of Block 3, Goliad County School Lands. Saturation was found in the Cook lime at 2,883-91 feet, which was acidized. Operators are attempting to shut off salt water believed to be coming from the Noodle Creek lime at about 2,655 feet. Should the section fail to yield commercial production the test will be carried to the Hope lime at about 3,066 feet.

WEST CENTRAL TEXAS COMPLETIONS

(24-hour gauge)

Callahan County

Petroleum Producers No. 1 Morrissett, dry and abandoned at 1,763 feet. A. W. Warren No. 1 Parks, dry and abandoned at 307 feet. Warren & Kliener No. 6-A Clark, dry and abandoned at 783 feet. Webb No. 1 Cottle, abandoned location. Westgate-Greenland No. 1 Yost, dry and abandoned at 2,155 feet.

Coleman County

Lane No. 1 McDermett, dry and abandoned at 510 feet. Stalcup No. 1 Polk, dry and abandoned at 1,340 feet.

Comanche County

Christmas No. 1 Casper, dry and abandoned at 900 feet. McCarter No. 2 Robertson, 637-42 feet, 40 bbls.

Eastland County

Gamblin No. 2 Daniels, dry and abandoned at 605 feet.

Fisher County

Baker No. 1 Burnham, dry and abandoned at 3,214 feet.

Palo Pinto County

Dalton No. 1 Dalton, 1,220-38 feet, 13 bbls.

Shackelford County

Dettenhaim No. 2 Lynch, abandoned location. Hart No. 1 Lee, dry and abandoned at 758 feet. Heltzel & Schkade No. 1-A Mathews, dry and abandoned at 831 feet. Lee & Kay No. 16 Diller, 553-65 feet, 10 bbls. Owens-Snebold No. 5 Lee, dry and abandoned at 1,233 feet. Owens-Snebold No. 1 McKeever, 2,610-80 feet, 1,500 bbls.

Jones County

Fain-McGaha Oil Co. No. 4 Shaheen, 1,878-1,900 feet, 320 bbls. Fain-McGaha and Sinclair Prairie No. 3 Olsen, 3,210-22 feet, 2,240 bbls. B. Fields No. 2 Humphrey, 3,252-66 feet, 1,571 bbls. Healey & Walters No. 6 Daughtry, 1,892-1,910 feet, 325 bbls. Jones & Stasney No. 1 Crow, dry and abandoned at 3,400 feet. Pearson and others No. 1 White, 1,971-84 feet, 50 bbls. Petroleum Producers No. 2 Steffens, 1,879-82 feet, 365 bbls. Ungren & Frazier No. 1 Smith, 3,248-67 feet, 420 bbls.

Stephens County

Lone Star Gas Co. No. 1-A McKee, 4,107-17 feet, 261 bbls. Rich No. 2 Andrews, 3,664-70 feet, 30 bbls.

PANHANDLE FIELD COMPLETIONS

Gray County

Magnolia Pet. Co. No. 22 Merten B, 3,130-90 feet, 225 bbls. D. R. Tripplehorn No. 2 Webb, 2,610-55 feet, 87 bbls. Sinclair Prairie Oil No. 8 Coomley, 3,118-3,220 feet, 455 bbls. S. & S. Oil Co. No. 3 Benton, 3,200-94 feet, 456 bbls. Manston Oil Co. No. 6 Sullivan, 3,235-45 feet, 448 bbls.

Hutchinson County

Stanolind Oil & Gas Co. 15 Terry, 2,955-89 feet, 157 bbls. Gulf Oil Corp. No. 7 Cockrell B, 3,009-80 feet, 178 bbls.

Donley County

H. C. Robinson No. 1 Kuteman, dry and abandoned at 4,406 feet.

Moore County

Texoma Natural Gas Co. No. 2 S. P. Goeber, 2,790-3,185 feet, 11,451,000 cu. ft. gas.

Kansas Fields

(Continued from Page 70)

SE Section 11-24-11w, Zenith field, Stafford County, flowed 148 bbls. of oil in four hours and made 24-hour potential of 1,454 bbls. of oil, pumping and flowing. Production was from Misener sand at 3,750-63 feet, total depth.

Same company's No. 5 Fuller, C S half NE SW Section 11-24-11w, found Misener sand at 3,740-63 feet, total depth, flowed 116 bbls. of oil in four hours and on completion test made potential of 1,441 bbls., pumping and flowing.

Stanolind Oil & Gas Co. No. 2 Harbeson, C N half SE NW Section 11-24-11w, was rigging up rotary. Same company's No. 6 Hayes, N half SE SE Section 11-24-11w, also was rigging up rotary.

Cowley County

Hartman & Blair No. 4 Waite, NE SE SW Section 21-31-4e, in the Hittle pool, Cowley County, pumped and flowed 2,315 bbls. of oil in eight hours and was completed for daily potential of 6,945 bbls. of oil. Arbuckle lime was topped at 3,273 feet and the hole was bottomed in lime at 3,277 feet.

Roth Oil & Gas Co. No. 3 Gretsinger, SW NE NE Section 15-31-4e, was a location.

Harvey County

Okan Drilling Co. No. 1 Ashman, C NW NW Section 29-23-3w, in the Harvey County sector of the Burrton field, topped chat at 3,254 feet and was completed in that formation at 3,371 feet, total depth. It pumped 146 bbls. of oil in eight hours and made daily potential of 438 bbls.

Kingman-Pratt Counties

Skelly Oil Co. No. 1 Miles, C S half NE Section 19-27-10w, Cunningham pool, Kingman County, topped Lansing-Kansas City lime at 3,483 feet and drilled in that formation to 3,500 feet, total depth. It flowed 116 bbls. of oil in eight hours and made potential of 347 bbls. with some water.

In the Pratt County sector of the Cunningham field, Drillers Gas Co. No. 1 Hoagland, SE NE SE Section 26-27-11w, was completed for 28,666,000 cu. ft. of gas daily from Viola lime at 4,062-78 feet, total depth.

Sinclair Prairie Oil Co. No. 1 Greiber, NE SE SE Section 26-27-11w, Pratt County, was building rotary rig.

East Texas Fields

(Continued from Page 76)

Kaufman County

Holding the interest in Kaufman County was the W. S. McGee No. 1 Phoenix Realty Co., in the Baker Survey, across the line from Henderson County and north of the Flag Lake pool. The test is reported to have cored 2 more feet of saturation at 3,088-90 feet and preparations are being made to cement casing for a test. This is McGee's third test in the vicinity. He has pulled casing from No. 1 Elliott and No. 1 Prichett, both in the same survey as No. 1 Phoenix Realty Co.

EAST TEXAS FIELD COMPLETIONS

(One-hour gauge)

Gregg County—Kilgore Area

Bohn & Rutledge No. 1 State School Land, 3,580-82 feet, 12 bbls.

EAST CENTRAL TEXAS COMPLETIONS

Cherokee County

C. C. Lanier No. 1 O'Neil, dry and abandoned at 3,910 feet.

Kaufman County

McGee No. 1 Elliott, dry and abandoned at 3,112 feet.

Lamar County

Dahl Brothers & Barr No. 2 McQuiston, dry and abandoned at 30 feet.

Nacogdoches County

D. McDaniels No. 1 Muckleroy, dry and abandoned at 1,002 feet.

Red River County

Daniels No. 1 J. J. Gaston, dry and abandoned at 1,274 feet.

Upshur County

Gaskill Oil Corp. No. 1 Arnold, dry and abandoned at 3,693 feet.

NORTH TEXAS COMPLETIONS

Archer County

Bridwell Oil Co. No. 1 F. Schroeder, 1,875 feet, dry. W. King No. 3 D. D. Strange, 1,170 feet, dry. Ligon & Deep Oil Development Co. No. 3 L. F. Wilson, 4,280-4,320 feet, 1,250 bbls. E. B. Madden No. 4 J. T. Richardson, 1,201 feet, dry. Shappell Oil Co. No. 20 Grace Bell, 972-85 feet, 89 bbls. Shell Petroleum Corp. No. 1 J. J. Perkins, 1,475 feet, dry.

Clay County

Kimmell Lee & Co. No. 9 Mrs. L. Firestone, 1,108-39 feet, 350 bbls. T. A. Norwood No. 1 T. P. Duncan, 1,165-80 feet, 45 bbls.

Cooke County

W. O. Russell No. 1 J. W. Sherrill, 2,301 feet, dry. Townsley and others No. 1 K. Fleitman, 1,750 feet, dry.

Jack County

C. A. Everts No. 1 J. H. Vick, 2,850 feet, dry. Showers & Moncrief, Inc., No. 1 T. C. Rogers, 3,175-3,214 feet, 355 bbls.

Montague County

Seitz & Comegys No. 7 J. B. Roach B, 2,124-40 feet, 154 bbls.

Wichita County

Consolidated Oil Co. No. 21 W. P. Ferguson, 3,693-3,785 feet, 2,200 bbls. Deep Oil Development Co. No. 2 R. J. Bradley, 3,702-92 feet, 703 bbls. E. C. Oil Co. No. 4 W. L. Hodges A, 3,760-3,946 feet, 783 bbls. King Oil Co. No. 1 Waggoner B, 3,844-77 feet, 501 bbls. Staley Oil Co. No. 12 Mrs. A. Mangold, 3,780-3,847 feet, 656 bbls. M. Staniforth & Co. No. 2 S. George, 1,379-81 feet, 13 bbls.

Wilbarger County

Falls Refining Co. No. 2 J. L. Owens, 2,598-2,640 feet, 750 bbls. L. V. Fitzwater No. 1 W. T. Waggoner, 721 feet, junked. Golding & Cochran No. 5 W. T. Waggoner S, 1,514-22 feet, 200 bbls.

Young County

Jennings Drilling Co. No. 1 J. A. Hutchings, 1,050 feet, dry. Thos. A. Jirik No. 2 W. M. Graham, 1,095 feet, dry. Magee & Stipe No. 1 H. E. Neeley, 1,119-34 feet, 10 bbls. Nehls and others No. 1 S. M. Smith, 3,961-4,072 feet, 7 bbls. Cosden Petroleum Corp. No. 2 D. D. Sewell, 3,800 feet, temporarily abandoned. Dean Bros. and others No. 1 J. C. Vaughn, 4,340 feet, dry. Homestead Oil & Gas Co. No. 2 J. F. Knight, 3,745-96 feet, 1,108 bbls. Rathke Oil Co. No. 1 Elkins, 3,550 feet, dry. Underwood & Campbell No. 36 R. Campbell, 931 feet, dry. J. G. Wootten and others No. 1 Graham Stewart, 856-70 feet, 5 bbls.

Market Record of Active Oil Stocks

Compiled by Carl H. Pforzheimer & Co., 25 Broad Street, New York City, Member New York Stock Exchange and New York Curb Exchange

New York Stock Exchange

1939 High	1939 Low	Week ending Apr. 8 High	Week ending Apr. 8 Low	Week ending Apr. 8 Close	Stocks—	Total shares outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1938	Com. sh. earn. 1937	Com. sh. earn. 1936	1938 High	1938 Low	1937 High	1937 Low
69½	51	58⅛	51	51	Amerada Corp.	788,675	N.P.	50cQ	1-31-39	$2.00	$3.04	$2.52	78	55	111⅞	51½
23½	19⅜	20¼	19⅜	19⅜	Atlantic Refining	2,663,999	$25	25cQ	3-15-39	1.00	3.51	2.59	27⅜	17¾	37	18
21½	10⅞	14¼	10⅞	10⅞	Barber Asphalt Co.	390,223	$10	75c	12-16-37	....	1.91	1.14	23¾	12⅛	43⅜	10⅛
19½	12⅞	15	12⅞	13	Barnsdall Oil Co.	2,250,344	$5	25cQ	2-1-39	1.00	.85	1.01	21⅜	10⅛	35¼	10
9¼	7½	8¼	7½	7½	Consolidated Oil Corp.	13,915,167	N.P.	20cQ	5-15-39	.80	1.48	1.18	10⅜	7	17⅜	7
31½	22	25½	22	22¼	Continental Oil of Delaware	4,682,581	$5	25cQ	3-31-39	‖1.00	2.98	2.05	35¾	21¼	49	24
8⅜	5	6⅛	5	5	Houston Oil (new)	1,098,618	$25	. .	10-17-30	....	.94	—.03	9¾	5	17⅝	4¾
16½	12	13⅞	12	12	Mid-Continent Petroleum	1,857,912	$10	25c	6-1-39	.60	2.86	2.57	22⅝	12¼	35⅜	14
14⅞	10½	11½	10½	10½	Mission Corporation	1,382,945	$10	$1	6-29-38	1.00	1.31	.48	17¾	10⅝	34	15
15½	6½	9¼	6½	6½	National Supply	1,155,170	$10	$2 pf.‡	12-22-37	....	4.90	2.02	23	12½	41⅜	17⅝
10¼	7	8	7	7	Ohio Oil Co.	6,563,377	N.P.	20c	12-15-38	.20	1.30	.70	14⅞	8⅜	22⅞	8
11⅞	10	10⅜	10	10	Pacific Western Oil	1,000,000	N.P.	50c	12-20-38	.50	1.39	1.58	15⅞	10¼	29¾	11⅜
6⅜	5¼	5½	5½	5½	Pan American Pet. & Trans.	4,702,945	$5	$1*	12-21-37	....	1.18	.52	9¼	6¼	17⅛	7
43⅜	32	35¼	32	32¼	Phillips Petroleum	4,449,052	N.P.	50cQ	3-1-39	‖2.00	5.42	4.02	44⅜	27¼	64	30⅛
22½	17¾	19⅜	17¾	17¾	Plymouth Oil Co.	1,008,000	$5	35cQ	3-31-39	1.40	2.85	1.65	25⅜	15	29⅞	13
11¼	7	8⅜	7	7	Pure Oil Co.	3,982,031	N.P.	25c	12-1-37	....	2.15	1.63	13½	8¼	24⅜	8⅜
10¼	6¾	8	6¾	6⅞	Richfield Oil Corp.	3,896,638	N.P.	50c	12-21-38	.50	.35	....	9⅞	5	6½	4⅛
22⅜	16⅛	18¼	16⅛	16½	Seaboard Oil of Delaware	1,244,383	N.P.	25cQ	3-15-39	1.00	1.97	2.00	27½	15½	54⅛	16
15⅛	11¼	12⅜	11¼	11¼	Shell Union Oil	13,070,625	N.P.	35c	12-20-38	.70	1.44	1.57	18⅜	10	34⅜	14⅞
29½	18½	22	18½	18½	Skelly Oil	995,349	$15	50c	12-15-38	1.00	6.07	4.42	34¾	18½	60⅝	28½
13¾	10⅞	12⅛	10⅞	11	Socony-Vacuum	31,151,071	$15	25cSA	3-15-39	.50	1.82	1.38	16⅜	10¾	23¼	13
30⅛	26	26¾	26	26	Standard Oil of California	13,014,754	N.P.	30cQ†	3-15-39	1.40	3.17	1.79	34⅞	25⅛	50	27⅛
29⅛	24½	25⅝	24½	24⅝	Standard Oil (Indiana)	15,272,020	$25	25cQ	3-15-39	1.00	3.66	3.09	35½	24¾	50	26½
50⅝	50¼	50⅝	50⅝	50⅝	Standard Oil of Kansas	112,837	$10	$2	12-8-38	2.00	6.93	1.91	50¼	32½	43	30⅝
53¼	43	46⅞	43	43	Standard Oil of New Jersey	26,224,767	$25	50c§	12-15-38	§1.50	5.64	3.73	58⅜	39¾	76	42
66	46	57	46	46	Sun Oil	2,316,484	N.P.	25cQ	3-15-39	1.00	3.86	3.25	65⅛	45	77½	44½
3¼	2	2⅜	2	2	Superior Oil Corp.	1,388,079	$1	10c	12-28-38	.10	.32	.14	4¼	1⅜	7¾	1½
48¼	35	40½	35	35	Texas Corp.	10,876,882	$25	50cQ	4-1-39	2.00	5.02	4.10	49⅝	32⅝	65⅛	34¾
5⅜	3⅝	4½	3⅝	3⅝	Texas Gulf Producing Co.	888,142	N.P.	10c	6-15-39	.15	.68	.93	5⅞	2⅝	9⅝	2
10⅛	7⅝	8½	7⅝	7⅝	Texas Pacific Coal & Oil	888,236	$10	10c	3-1-39	.40	1.11	.72	12½	7	16⅝	5⅝
14¼	11⅞	13¼	11⅞	11⅞	Tide Water Associated	6,375,253	$10	25c	3-1-39	1.00	2.08	1.03	15¾	10⅛	21⅝	13⅛
19¾	16¾	17⅝	16¾	16¾	Union Oil of California	4,666,270	$25	30cQ	2-10-39	1.20	2.58	1.40	22½	17⅛	28¼	17½
23⅝	20⅛	20⅝	20⅛	20⅛	Union Tank Car Co.	1,177,381	N.P.	30cQ	3-1-39	1.30	1.70	1.76	23½	20	31½	22
3¾	2½	2⅞	2⅝	2⅝	Wilcox Oil & Gas	506,522	$5	....	5-10-28	....	.24	—.06	3½	1⅝	6¼	1¾

*Payable in 3⅛ per cent notes. †Includes extras. ‡One-tenth share $2 preferred stock. §Also 1⅛ per cent stock dividend. ‖Also right to subscribe to bonds.

New York Curb Exchange

1939 High	1939 Low	Week ending Apr. 8 High	Week ending Apr. 8 Low	Week ending Apr. 8 Close	Stocks—	Total shares outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1938	Com. sh. earn. 1937	Com. sh. earn. 1936	1938 High	1938 Low	1937 High	1937 Low
9	6⅜	6⅞	6⅝	6½	American Republics Corp.	1,308,049	$10	10c	7-11-38	$0.10	$0.27	$0.28	11¾	5	10	6⅝
7¼	3½	4¾	3½	3½	Bridgeport Machine Co.	260,000	N.P.	$1.25	12-30-37	....	1.90	1.26	10¼	4⅞	21⅜	7
34¾	27¼	30¼	30	30	Buckeye Pipe Line Co.	200,000	$50	50c	3-15-39	2.00	4.02	4.40	39	22½	51½	36
130	115	115	115	115	Chesebrough Mfg. Co.	120,000	$25	$1.50Q†	3-27-39	6.50	6.73	7.46	128	97	12	95½
9¼	6	7¼	6	6	Cities Service (new)	3,714,317	$10	....	6-1-32	....	1.02	.13	11	5⅛	5⅝	1½
1⅛	½	⅛	⅛	⅛	Cosden Petroleum	462,551	$1	....	.....	....	.19	...	2⅜	⅞	5½	1½
23¾	17½	20	18⅝	18¾	Creole Petroleum	6,975,383	$5	50cSA†	12-15-38	1.00	1.61	1.23	27½	17½	38¾	20¼
7⅛	5	6	5	5	Darby Petroleum	351,390	$5	25cSA	1-15-39	.50	1.36	1.26	10¼	5½	18⅝	6½
2¼	1⅝	1⅞	1⅝	1⅝	Derby Oil & Refining	263,162	N.P.	....	.....	....	1.34	.66	3½	1½	8⅜	2¼
20	17½	17½	17½	17½	Eureka Pipe Line	50,000	$50	50c	2-1-39	3.00	—.12	—.62	31	16	47½	24½
40	31	34½	31	31	Gulf Oil Corp.	9,076,202	$25	25cQ	4-1-39	1.00	3.51	2.90	46⅞	33	63⅛	33
69⅝	53	59¼	53	53½	Humble Oil & Refining	8,987,840	N.P.	37½c	4-1-39	3.00	5.22	3.80	72⅝	56	87	54⅞
17	15⅛	16⅜	15½	15½	Imperial Oil of Canada	26,965,078	N.P.	62½cSA†‡	12-1-38	1.25	.98	.95	19½	14⅛	24¼	14½
7	6⅛	6¼	6¼	6¼	Indiana Pipe Line	300,000	$10	30ç	5-15-39	.50	1.03	1.00	9⅜	6	15	5⅞
27½	23⅛	25⅜	23⅛	23⅛	International Petroleum	14,324,088	N.P.	$1.25†‡	12-1-38	2.50	....	1.81	31¼	21	39⅛	23½
3½	2½	2¾	2½	2½	Kirby Petroleum Co.	500,000	$1	10c	4-15-38	.10	.17	.20	5	2⅛	8⅜	2⅝
20¼	12⅝	17	12⅝	12⅞	Lion Oil Refining	435,815	N.P.	25cQ	4-20-39	1.00	2.17	1.43	25⅛	15⅝	34	12½
9½	7⅛	8⅛	7⅛	7⅛	Lone Star Gas	5,553,747	N.P.	20c	4-20-39	.60	1.14	1.02	10⅜	6⅝	14¼	5¼
7¾	5	6½	5	5	Louisiana Land & Exp.	2,977,449	N.P.	10cQ	3-15-39	.45	.58	.64	9⅝	6½	15¼	6⅜
17	16	16	16	16	Margay Oil Corp.	149,918	N.P.	25cQ	4-10-39	1.00	3.26	1.19	24	16	33½	17
8¾	7¼	8⅛	7¼	7¼	Midwest Oil Co.	998,474	$10	50c	12-15-38	1.00	1.14	.95	9¾	6⅝	14⅝	6¼
5½	4⅞	5¼	4⅞	4⅞	Mountain Producers	1,593,584	$10	30cSA	12-15-38	.60	.76	.62	5¾	4½	7⅜	4⅛
13¼	11½	12	11½	11¾	National Fuel Gas	3,810,183	N.P.	25cQ	4-15-39	1.00	.96	1.19	14⅝	11½	19⅛	12
8½	7⅛	..	..	..	National Transit	509,000	$12.50	40c	12-15-38	.75	1.19	.79	9¼	6½	12⅛	7¼
1¾	1½	1½	1½	1½	New Mexico and Arizona	1,000,000	$1	1c	12-1-37	....	.02	.02	2⅝	1½	5	1⅜
4⅞	4	..	..	..	New York Transit	100,000	$5	15c	4-15-39	.25	.49	.34	4½	3½	5⅜	3⅜
5⅝	4½	..	..	..	Northern Pipe Line	120,000	$10	15c	12-1-38	.35	.78	.66	6	4	12⅜	5⅝
7⅝	4⅜	5⅜	4⅜	4⅜	Pantepec Oil	2,441,142	$1	....	.....	....	....	.05	7¾	3½	9⅝	2⅜
2¾	1⅝	1⅞	1⅝	1⅝	Root Petroleum Co.	336,045	$1	25c	2-1-37	....	—.17	.45	4½	1⅝	12⅜	2
3	1⅞	2¾	2⅛	2⅛	Ryan Consolidated	296,931	N.P.	....	.....	....	.46	....	4	2⅛	6⅛	2¼
4	3½	..	..	..	Southern Pipe Line	100,000	$10	15cSA	3-1-39	.30	.85	.41	5⅜	3¼	7¼	3⅜
34⅞	29	30⅝	29	29	South Penn Oil	1,000,000	$25	37½cQ	3-31-39	1.75	4.64	3.59	39	28¾	56	35
19¾	17	..	..	..	Southwest Penna. Pipe Lines	35,000	$50	50cQ	4-1-39	2.00	.95	.97	22¼	16½	42	30
18¾	17½	18½	17⅝	17⅝	Standard Oil of Kentucky	2,604,790	$10	50cQ†	3-15-39	1.25	1.60	1.46	18¾	15	21⅛	14⅝
6⅞	6	6¼	6⅛	6⅛	Standard Oil of Nebraska	161,403	$25	25c	3-29-37	....	—.58	.42	8¾	5½	13¾	8
21¼	17¾	18¾	17¾	17¾	Standard Oil of Ohio	753,740	$25	25c	3-15-39	1.00	3.67	4.77	22¾	16¼	45	16
2⅝	2	2⅛	2	2	Sunray Oil	2,006,176	$1	5c	4-27-39	.05	.42	.26	3¼	2	4⅜	2
4	3	3¼	3⅛	3⅛	Texon Oil & Land	936,024	$2	15cQ	9-30-38	.60	.51	.36	5¼	3½	7⅝	2
5½	2½	3¼	3⅛	3⅛	Transwestern Oil Co.	750,000	$10	....	.....	....	.48	.06	7⅝	4¼	13⅛	4⅝
3⅝	1⅝	2¼	1⅝	1⅝	United Gas Corp.	7,818,959	$1	....	.....	....	.25	.20	5¼	2⅝	13⅞	3

†Includes extras. ‡Payable in Canadian funds. §Of which $1 was in preferred stock.

Personal Paragraphs

LON HUDDLESTON is president, J. H. GWIN vice president and E. J. BARTELS secretary-treasurer of the newly formed Indiana Oil & Refining Co. The company is moving equipment of the old Trinity Refining Co. from Gladewater, Tex., to Mount Vernon, Ind., where it will be combined with a cracking unit.

GEORGE CALVERT, BERT F. WEEKLEY, GEORGE FAGG, and JACK LOFFLAND, oil men of Fort Worth, Tex., left last Friday for an extended hunting trip in Alaska. They went by rail to Seattle, Wash., where they were to board a vessel for Alaska. All but Mr. Fagg returned a few months ago from a hunting trip in northern Canada.

RALPH JOHNSTON, independent operator of Houston, Tex., has returned from a vacation on the Pacific Coast.

T. F. PALMER, formerly in Sinclair Prairie Oil Co.'s land department at Fort Worth, Tex., has been transferred to Corpus Christi, Tex., as assistant land man.

R. J. STONE, general superintendent of the Standard Oil Co. of Louisiana, sailed recently from New York for Aruba, expecting to be gone about three weeks.

LON H. CRON, of Cron & Gracey, drilling contractors, returned last week from Cuba, where his firm is drilling a wildcat for one of the major companies.

A. E. BARRUS, secretary-treasurer of Sinclair Wyoming Oil Co., Tulsa, accompanied by Mrs. Barrus, left last week for a motor tour of the New Orleans, La., district.

T. M. MARTIN, vice president of Lion Oil Refining Co., has been elected a vice president of the Asphalt Institute and also a member of the organization's executive committee.

IRA JARRED, of Shreveport, La., has joined the Delta Drilling Co. as land man. He formerly was associated with the Sun Oil Co. in the Shreveport, La., office.

GOLDIE S. WILKIE, former toolpusher for the Magnolia Petroleum Co. in Rodessa and the Ark-La-Tex area, is en route to Colombia, South America, to supervise drilling operations for the company.

DONALD R. RICHBERG, former administrator of the N.R.A. and now representative of the oil companies whose properties were expropriated by Mexico, will speak Friday of this week at the National Petroleum Association's annual meeting in Cleveland on "The Mexican Oil Problem."

WINTHROP HAYNES, chief geologist of the Standard Oil Co. of New Jersey, served as guide recently for two foreign geologists viewing interesting points in the Mid-Continent. DR. SIMON PAPP, chief geologist of the Hungarian-American Oil Co., at Budapest, and FRITZ KASELITZ of Romano Americana Oil Co., Bucharest, were guests of Mr. Haynes. They were accompanied by geologists and engineers of the Carter Oil Co., Standard Oil Co. of Louisiana, and Humble Oil & Refining Co.

F. E. BROAD, export representative of Macmillan Oil Co., with offices in Kobe, Japan, is in southern California on a business and pleasure trip. He will return to Japan in about three weeks.

B. I. GRAVES, a director and vice president of Tide Water Associated Oil Co., was elected director and vice president of Western Minerals Co. and Pioneer Midway Oil Co., Consolidated, and a director of Sterling Oil & Development Co. at the annual meetings of these organizations.

D. L. CALDWELL, Barnsdall Oil Co., Los Angeles, Calif., has been appointed national chairman for 1939 of the topical committee on drilling and production practice of the American Petroleum Institute's Division of Production. Appointments of district chairmen for 1939 have been made as follows: California, PAUL E. LEHR, Shell Oil Co., Los Angeles; Mid-Continent, I. S. SALNIKOV, Carter Oil Co., Tulsa; southwestern, P. D. TORREY, Sloan & Zook Co., Houston, Tex.; eastern, R. J. SULLIVAN, Carter Oil Co., Mattoon, Ill. Mr. Torrey has been appointed also chairman of the special subcommittee on secondary recovery methods. G. H. FANCHER, University of Texas, Austin, Tex., is chairman of the committee on water-flooding; M. A. WRIGHT, Carter Oil Co., Seminole, Okla., of the committee on gas repressuring; B. B. BOATRIGHT, of Parker, Foran, Knode & Boatright, Houston, of the committee on pressure maintenance.

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

An oil well in the Epworth M. E. church lot in Lima, Ohio, drilled at the expense of the congregation, has paid the minister's salary and all other church expenses, piled up a nice surplus, and supplied gas to heat the church.

Overproduction in Cushing, Okla., field, reduces the price of Mid-Continent oil to 90 cents, a 15-cent cut in two weeks.

John M. Arters, 65, widely known veteran oil man, and president of the Ajax Engine Co. of Corry, Pa., dies at his home in Pittsburgh, Pa.

20 YEARS AGO

Samuel Ralph, 68, of the Ralph Bros., prominent eastern oil and gas producers, died in Augusta, Ga., where he had gone in search of health. Mr. Ralph resided in Bradford, Pa.

S. A. Hobson, geologist, of Russellville, Ala., is confident that the right kind of operators with the right kind of geology and drilling methods could find oil and gas in commercial quantities in that state.

Natural Gas Association of America pays high tribute to its deceased secretary and treasurer, David Holbrook, in a neatly printed folder.

10 YEARS AGO

Gypsy Oil Co. opens a Wilcox sand pool in Sumner County, Kansas, close to the Grant County, Oklahoma state line.

Group 3 Refinery prices for gasoline range from 7 cents to 8¼ cents per gallon. Thirty-six gravity Mid-Continent crude is posted at $1.20.

General Palmer E. Pierce is appointed special assistant to President Walter C. Teagle of the Standard Oil Co. (New Jersey). He will devote his time principally to the company's Latin American interests.

LORD CADMAN, chairman of the Anglo-Iranian Oil Co., London, has accepted the chairmanship of the Television Advisory Committee.

HENRY A. ROACH, head of the Mardela Oil Corp., formerly of Dallas, Tex., has moved his headquarters to Fort Worth, Tex.

R. B. TANSEL, head of the Tansel Petroleum Co., Tulsa, accompanied by Mrs. Tansel and their two children, motored for the Easter weekend to Marysville, Kans., where they visited Mr. Tansel's mother.

JOHN L. McMAHON, formerly division manager of the Texas Co., Fort Worth, Tex., retired recently after 25 years' service and was honored by fellow employes and friends at a banquet in Wichita Falls.

JOHN McFAYDEN, vice president in charge of the western division of the Ohio Oil Co., has returned to his headquarters in Casper, Wyo., after an extended trip to the company's operations on the West Coast.

LAWRENCE HEWITT, formerly with Sinclair Prairie Oil Co. in the Baton Rouge, La., office, has been placed in charge of the new geological office which the Midstates Oil Corp. has opened in New Orleans, La.

LEE ELLZEY, superintendent of the Holliday district of the Humble Oil & Refining Co., entertained employes of the district last week with a venison dinner at the Holt Hotel in Wichita Falls, Tex. The dinner celebrated achievement of a 100 per cent field inventory for 1938.

DIXIE MORRIS, petroleum engineer with the Union Producing Co., has been transferred from Rodessa, La., to Houston, Tex.

A. R. THOMPSON, active in the Illinois development, was named chairman of the Petroleum Dinner Club, organized in Mattoon to afford oil men of that area opportunity to get together. T. I. DARLAND was chosen secretary-treasurer.

JOHN R. MANION, vice president and general manager of the Sinclair Refining Co., pipe line department, Tulsa, received news last week that he was a grandfather, a daughter having arrived at the home of EDWARD MANION, attorney and banker of Beaumont, Tex.

HON. N. E. TANNER, minister of lands and mines for Alberta; W. F. KNODE, chairman of the Alberta Conservation Board, and DR. G. S. HUME, of the Geological Survey of Canada, were to sail this week from St. John, N. B., for England to discuss wider marketing of Alberta crude with the British Government and British financial interests. In contemplation is construction of a pipe line to deliver Turner Valley crude either at a Pacific Coast point or at Fort William, on Lake Superior.

G. S. CONNORS, manager for Williams Brothers Corp., Tulsa, and S. D. Bechtel Co., San Francisco, in charge of the construction of the 100-mile pipe line of the Mene Grande Oil Co., Venezuela, and H. C. PRICE, president of H. C. Price Co., which has the welding contract for the line, left by plane this week from Miami for South America. There they were to join DAVID R. WILLIAMS, vice president, and A. M. GARBER, superintendent, of Williams Brothers Corp., who are now at Guanta, where pipe is being laid.

Starts Second 25 Years

R. B. High, manager of the Shell Pipe Line Corp., recently completed his first quarter-century of Shell service and started on his second with no signs of slowing up. When Mr. High joined the organization it was operating as the American Gasoline Co. He had graduated from the University of California and was looking for a landing-place when, in December, 1913, he was offered the job of construction superintendent of the Coalinga tank farm. His oil career had started.

R. B. HIGH

When the tank farm job was completed young High was retained in the engineering department until March, 1917, when he was transferred to the Roxana Petroleum Corp., a subsidiary, for the construction of the Wood River refinery. When the Norco refinery, also built under his supervision, was finished in May, 1920, he was made its operating superintendent. Seven years later he was placed in charge of the Arkansas City plant. Then he was made superintendent of the Wood River plant. In 1929 he directed construction of the Houston, Tex., refinery, and upon its completion he served as its superintendent.

In January, 1934, Mr. High was appointed manager of manufacturing, with headquarters in St. Louis. He was advanced to his present post in January, 1938. One result of the frequent changes of residence is that Mr. High has acquired a remarkable number of friends. He likes golf and hunting, but doesn't get much time for them.

C. A. WARNER, in charge of the land department for the Houston Oil Co., left last week for a business trip to Baltimore.

ROY B. JONES, president of Panhandle Refining Co., Wichita Falls, Tex., was named chairman of the Texas-Louisiana regional public relations committee of the American Petroleum Institute at an organization meeting held in Dallas last Saturday.

LADY DETERDING, widow of Sir Henri Deterding, became the mother recently, in a Berlin nursing home, of a daughter, who will inherit a one-eighth share in her father's estate. Sir Henri, who was head of the Royal Dutch-Shell interests, died last February 4, leaving an estate estimated at $10,000,000.

DR. MALVIN G. HOFFMAN, chief geologist of the Midco Oil Corp., Tulsa, and Mrs. Hoffman are on a honeymoon cruise in the Caribbean. Doctor Hoffman was a paleontologist for four years with the Marland and Atlantic companies, was in the field for the Carter Oil Co. four years, obtained his doctorate at Chicago University and taught geology for seven years at Washington State College. Mrs. Hoffman was Mildred Lieberman, of Tulsa.

BURDETTE BLUE, president of Indian Territory Illuminating Oil Co., Bartlesville, Okla., has been named chairman of the Independent Petroleum Association's committee on award for a student essay contest sponsored by the association. The vice chairman is FRANK M. PORTER, Oklahoma City, vice president of Wirt Franklin Petroleum Corp. The contest, open to senior high school students in the 18 oil-producing states, will close June 30. The essays are to be on "What Oil and Gas Have Done for My Community."

J. T. REEVES, formerly district superintendent for the Sinclair Prairie Oil Co. in the Wink, Tex., district, has been made assistant division superintendent of the West Texas division, with headquarters in Midland. R. A. WRIGHT, formerly district superintendent at Odessa, Tex., succeeds Mr. Reeves at Wink. Both promotions are among changes resulting from the recent resignation of HORACE F. FITZPATRICK as assistant to the chairman of the board.

SHIFTS: H. L. GRILEY, geologist Sun Oil Co., from St. Joseph, Mo., to Tulsa; O. C. HOWELL, drilling contractor, from Kenedy, Tex., to Overton, Tex.; C. O. GARBRECHT, engineer Talco Asphalt & Refining Co., from Fort Worth, Tex., to Bay Petroleum Corp., Denver, Colo.; W. R. KENNEDY, engineer the Texas Co., from Olney, Tex., to Wichita Falls, Tex.; S. RHODES, drilling contractor, from Jennings, La., to Natchitoches, La.; ROBERT D. HANNA, vice president Mex-Seaboard Oil Co., from Miami, Fla., to New York; E. R. BROCKWAY, geologist Devonian Oil Co., from Salem, Ill., to Shreveport, La.; CHESTER IMES, president United American Petroleum Co., from Tulsa to Evansville, Ind.; R. P. BOLTON, from Bucarest, Rumania, to The Hague, Holland; E. I. HEAD, engineer Gulf Oil Corp., from Lawrence, Kans., to Carbon Hill, Ala.; L. L. SMITH, superintendent Continental Oil Co., from Lewistown, Mont., to Glenrock, Wyo.

HAROLD BISHOP, New York, president of the Crystal Refining Co., Shreveport, La., and interested in oil operations in the Southwest, Mid-Continent and Illinois, has returned from a tour of Louisiana, Texas, Oklahoma and Kansas.

HOWARD BOYD, since 1934 chief scout for the Magnolia Petroleum Co., with headquarters in Dallas, Tex., has been transferred to the land department in Wichita, Kans. W. P. DUNCAN, JR., scout in the Lea County, New Mexico, district, has been named chief scout. B. A. MOSS of Refugio, Tex., succeeds Mr. Duncan in New Mexico.

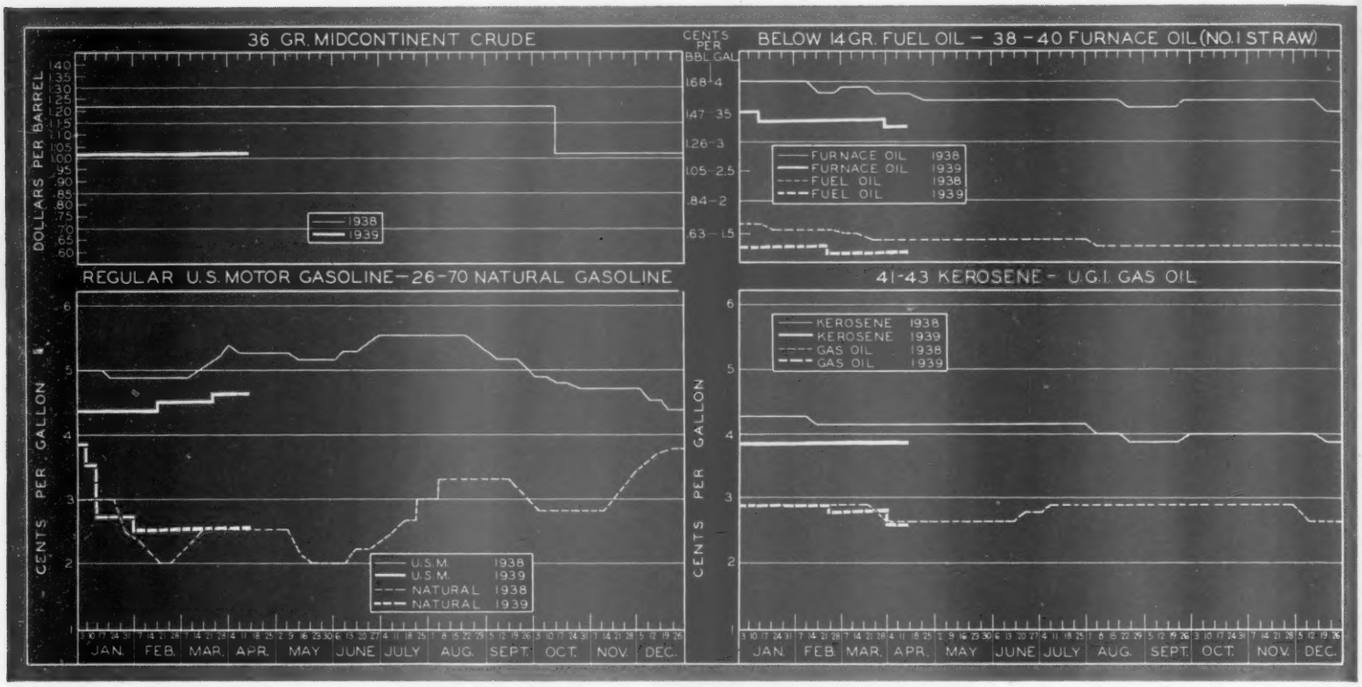
DR. PAUL H. PRICE, state geologist of West Virginia, spoke in Pittsburgh, Pa., last week before the annual meeting of the eastern district Division of Production, of the American Petroleum Institute. He said there was likelihood that new gas pools would be discovered in the Oriskany sand in West Virginia.

HAROLD NEELEY, president of the Iron Mountain Oil Co., Fort Worth, Tex., was called to Austin, Tex., where his son, a student in the University of Texas, was reported in a critical condition following an appendectomy.

WARREN SKELTON, geologist and oil operator of Thermopolis, Wyo., has been named state mineral supervisor by GOV. NELS SMITH. He succeeds PIERRE La FLEICHE, who before his appointment six years ago, was an independent oil operator.

D. F. SEARS has been appointed general superintendent of crude lines by Shell Pipe Line Corp., St. Louis, Mo., to succeed A. K. RIDDLE, who retired. D. H. LEWIS was appointed chief engineer. F. S. LEONARD continues as general superintendent of telephone and telegraph.

WILLIAM K. HALL has been appointed attorney for the Texas Pacific Coal & Oil Co., Fort Worth, Tex., succeeding the late John Hancock. Mr. Hall resigned from the Texas Co. to take the new post. He had been on that company's legal staff since 1926. He will move from Houston, Tex., where he now resides.


36 GR. MIDCONTINENT CRUDE
DOLLARS PER BARREL
1938
1939
CENTS PER BBL. GAL
BELOW 14 GR. FUEL OIL – 38 – 40 FURNACE OIL (NO. 1 STRAW)
FURNACE OIL 1938
FURNACE OIL 1939
FUEL OIL 1938
FUEL OIL 1939
REGULAR U.S. MOTOR GASOLINE – 26 – 70 NATURAL GASOLINE
CENTS PER GALLON
U.S.M. 1938
U.S.M. 1939
NATURAL 1938
NATURAL 1939
41-43 KEROSENE – U.G.I. GAS OIL
KEROSENE 1938
KEROSENE 1939
GAS OIL 1938
GAS OIL 1939
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

Representative Mid-Continent Quotations on Crude Oil and Refined Products, Basis Oklahoma (Group 3)

Gasoline Tightens in Group 3 Market and Naturals Take Higher Ground

By T. F. SMILEY

Most of those who tried to buy gasoline in the spot market from Oklahoma refiners in the past week ran into trouble. Although there seemed to be a slight easing up in the demand for low-octane material, buyers reported their efforts to pick up the better grades met with small success. Natural gasoline was up. Wax was extremely tight. Light burning oils continued to give ground. Tractor fuels were steady.

In addition to the steadily rising strength which gasoline has been acquiring from ordinary seasonal increase in gallonage since early February, it had the benefit of the lift in demand which attends Good Friday and Easter. Some groups of workers had a three-day holiday, which meant greater activity for the family car. "It just put us farther behind with our orders," said one harassed sales manager who had been trying to pry a few cars of motor fuel loose from somebody.

Low Stocks Attest Strength

Bringing the vigorous gasoline market into relief this week was the sold-out condition of some refiners and marketers who had come to be regarded as disturbing factors in the Group 3 market. Some were not only sold up, but were trying to buy material to fill their own contracts. One large sales agency in Chicago, whose heavy offerings sometimes have been a source of worry to Oklahoma refiners seeking business in the same territory, was unable to supply material to spot buyers in the past week, all it had being needed to meet contracts. Some major refiners who entered the market weeks ago for gasoline to supplement their own stocks were said still to be adding to their supplies as opportunity offered.

Refined Oil Market Barometer

The rightabout in gasoline stocks, which now are falling, has imparted a better feeling. Prices firmer in most areas except West Coast, and offerings scarce in much of the interior territory. Weak retail markets are acting as a deterrent to better tankcar prices. Naturals stronger, with prices up. Heavy industrial oil gaining. Heating oils sagging. Wax vigorous.

MID-CONTINENT. Gasoline tight. Naturals up. Wax vigorous. Heating oils weaker.

EAST COAST. Gasoline strengthening. Heavy fuels firm. Light fuels weak.

GULF COAST. Gasoline stronger, with prices slightly higher. Fuel oils firmer.

PENNSYLVANIA. Gasoline steady. Neutral oils improving. Wax active.

CALIFORNIA. Pleasant Easter stimulated gasoline consumption. General market weak.

CHICAGO. Gasoline strong, with some refiners short. Heavy fuels holding.

Buyers said they were encountering a little less difficulty in finding low-octane gasoline, except in Kansas. In that state small skimming plants were disposing of most of their output in nearby agricultural areas, where tractor demand is active.

Conforming to the pattern of other years, the country's gasoline stocks reversed their course with the arrival of April and instead of rising, began to decline. A drop of 284,000 bbls. in the week ending April 1 compares with a drop of 67,000 bbls. in the corresponding week of 1938. The heavier withdrawal this year was pointed to as a favorable omen. As a matter of fact, few Group 3 refiners now refer to the total gasoline stocks as anything to get scared about. Most of them say the cross-country touring which two world fairs will set in motion should bring these stocks to an economic level by the end of the heavy consuming season.

The chief source of uneasiness is the battered condition of the retail market. "What good will big gallonage do us if a demoralized market prohibits a fair profit?" asked one refiner. Although some progress has been made in the correction of weak spots, service station prices are subnormal in many areas which are outlets for Group 3.

Natural Gasoline Goes Higher

A stiffening market for natural gasoline added an eighth-cent to the prices asked in Texas. Several conditions contributed to the improved position of this division. One was buying for an export cargo, which was reported to have cleaned up offerings of the small manufacturers. Another was buying by refiners, who are preparing for an extraordinary summer demand. The increasing call for 67-octane fuel, with its heavier blend of natural, was also a factor.

Heating oils were drifting to lower levels. Surplus inventories of No. 2 straw, No. 2 dark, and low-cold-test material were showing up with greater frequency, and quotations were off. No. 1 prime white and No. 1 straw were fairly steady. Tractor fuel was moving in satisfactory volume. Kerosene and range oil, which qualify as tractor fuels, were holding well. Wax was experiencing its tightest market of the year.

Eastern Coast Motor Fuel Starts Rise; Heavy Industrials Firm

By H. STANLEY NORMAN

NEW YORK, Apr. 10—Effective April 10, Socony-Vacuum Oil Co., Inc., increased tankcar gasoline prices at East Boston and Providence, R. I., a quarter cent per gallon, making the new price 6½ cents.

The Gulf Coast primary market was reported up approximately an eighth of a cent making 70-octane motor fuel in the range of 5 to 5⅛ cents per gallon. The last definite sale reported for coastwise movement in April was at 5 cents which was an eighth of a cent higher than obtained for a cargo sold during the preceding week.

There were other encouraging signs in the refinery market including continued stiff prices for industrial fuel oil on the Gulf Coast at a range of 72 to 75 cents per barrel for bulk cargoes, slightly higher wax quotations and another boost in the Pennsylvania neutral oil structure. Pan American Petroleum & Transport Co. elevated the New York tankcar price for 70-octane motor fuel a quarter of a cent per gallon to 6 cents effective April 7. Some companies have been asking this price for similar quality motor fuel for several weeks, but there has been a considerable volume of business transacted at the low of the market range.

The summer's first reduction in motor fuel stocks amounting to about 285,000 bbls. for the week ended April 1 was reported in the trade to have been a factor in stimulating prices in the primary markets of the Gulf and other points. With exception of last Thursday (April 6) during which most of the North Atlantic seaboard territory was blanketed by a general rain driving conditions have remained inducive to automobile and commercial truck operation. Another reduction in motor fuel stocks was reported probable although complete figures for the week had not become available when this review was written.

Despite favorable market developments, the immediate outlook was not entirely free of clouds. Eastern oil men are watching developments in the Texas proration dispute with much interest and admit that, unless current disturbances are corrected, conditions may be reversed on short notice. However, hope has not been abandoned that the Texas Railroad Commission membership will find a basis for equitable distribution of allowables and prevent an upset in basic conditions.

Heavy fuel oils maintained their strong position in the Gulf Coast refinery market and reports were that limited quantities are available for prompt and near future loading. The heavy fuel cargo market is around 73 cents a barrel, though one quarter reported that a few plant operators were asking a top of 75 cents. The Bunker C fuel oil market in New York Harbor and other North Atlantic terminals is unchanged. Sellers are asking 95 cents per barrel in New York, exclusive of barging charges. Shore plant consumers are currently paying from 2½ to 2¾ cents per gallon for industrial fuel oils with probably a majority of business actually closed at 2⅝ cents.

Light fuel oils continued weak in all North Atlantic areas. Boston sellers were reported to have lowered the tankcar price about an eighth of a cent per gallon to 3¾ cents against 3⅞ cents in the preceding week. Kerosene is also weak in sympathy with other light burning oils and in New York tankcar deliveries can be arranged at 4¼ cents although a majority of sellers continue to quote at 4⅜ cents.

Motor fuel prices in Boston, Providence and Baltimore were reported to have stiffened late last week following the general pattern elsewhere. The three points had been depressed slightly in the preceding week on the tankcar side of the market principally in the higher octane grades. Boston prices were restored to a range of 5⅞ to 6⅛ cents per gallon after a few days during which sales were made in certain directions for 5¾ cents. Reduction of a quarter cent in high octane motor fuel price to 5½ cents per gallon at Baltimore instituted a week ago failed to win general market support and the majority of sellers there ask a minimum of 5¾ cents for 70-73 octane gasoline. An eighth of a cent reduction at Providence in the tankcar quotation by a few sellers for 70-octane motor fuel was discontinued during the latter part of the past week and a minimum of 5⅞ cents per gallon prevailed, according to reports in New York. Some sellers were quoting 6 and 6⅛ cents for the same trade and their volume was holding up reasonably well.

Effective April 4 Socony-Vacuum Oil Co., Inc., lowered the dealer tank-wagon price at Albany, N. Y., three-tenths of a cent per gallon to 13.5 cents but at this level the market remains well in the upper brackets of upstate New York quotations.

Facilities of the Doyle Gulf Oil Distributing Corp. in and around Rochester last week figured in one of the largest marketing deals reported in recent months. The facilities were sold to Gulf Refining Co. at a figure reported in the neighborhood of $2,000,000. The stations and bulk plants involved handle approximately 15,000,000 gallons annually. Opening of the New York barge canal the middle of this month is expected to stimulate motor fuel movement to points along this artery of transportation. Due to ice in the upper portion of this canal the opening was postponed two weeks beyond normal and stocks at many points have reached absolute minimum. Shipment of supplies during the latter weeks of spring and early summer to the section served by the canal in navigable weather has been on a hand-to-mouth basis for several weeks.

The willingness to purchase motor fuel for more distant requirements has been gaining momentum throughout the North Atlantic region in the past 10 days. One reason for abandonment of the hand-to-mouth buying practice is the normal upturn in demand after April 1. Furthermore, only three weeks remains until the official opening of the New York World's Fair and dealers throughout this section anticipate a more than normal gain in motor fuel demand starting May 1 and to continue all summer. Therefore, preparations for accommodation of the motoring public attending the New York fair are probably more responsible for the more liberal buying program than generally credited.

Most grades of neutral oil in western Pennsylvania were advanced during the past 10 days a half cent per gallon marking a continuation of market improvement in this material. Asking prices range from 16 to 16½ cents per gallon on 25 pour test neutrals of 200 viscosity. The market for 150 viscosity neutrals ranges from 14 to 15 cents. Much of the current neutral oil business is said to be among refiners. This season's demand for neutrals is reported in refinery circles to reflect on an even more impressive basis the general trend to lighter motor lubricants. Straightrun Pennsylvania gasoline was in active demand for re-

(Continued on Page 111)

A. P. I. Weekly Refinery Statistics

Week Ending April 8, 1939

	Capacity reporting (per cent)	Daily crude runs (bbls.)	Total gasoline stocks	Gas oil and fuel oil stocks
East Coast	100.0	490,000	22,096,000	6,022,000
Appalachian	85.9	92,000	3,397,000	729,000
Indiana, Illinois, and Kentucky	89.5	412,000	15,095,000	4,731,000
Oklahoma, Kansas, and Missouri	81.6	260,000	7,863,000	3,934,000
Inland Texas	50.3	100,000	1,637,000	1,749,000
Texas Gulf	89.5	793,000	10,079,000	7,087,000
Louisiana Gulf	97.3	128,000	2,628,000	1,378,000
North Louisiana and Arkansas	55.0	43,000	565,000	769,000
Rocky Mountains	54.2	48,000	1,864,000	732,000
California	90.0	438,000	16,219,000	96,218,000
Total reported	85.8	2,804,000	81,443,000	123,349,000
Estimated unreported	.....	341,000	5,170,000	2,850,000
*Estimated total	.....	3,145,000	86,613,000	126,199,000
*Estimated total previous week	.....	3,170,000	87,277,000	127,893,000
*April 10, 1938	.....	3,189,000	91,717,000	123,439,000

*Bureau of Mines, currently estimated.

Stocks of Crude Oil in the United States

(BUREAU OF MINES ESTIMATES)

Week ending March 25, 1939	273,915,000 barrels
Week ending March 18, 1939	273,345,000 barrels
Week ending March 26, 1938	307,557,000 barrels

Figures do not include stocks of heavy unrefinable California crude.

Retail Oil Markets

Tank-wagon and filling station prices on gasoline and kerosene furnished by the larger marketing firms.

Prices as of April 11, 1939

Taxes

The gasoline quotations given in the following tables include the 1-cent federal tax, as well as state, county, and city taxes. The gasoline is the regular or standard grade. In most areas lower grades and a premium grade also are available.

Standard Oil Co. (Indiana)

	Gasoline Tank-wag.	Gasoline Dlr.	Gasoline Inc. tax	Kero. tank-wag.
Chicago, Ill.	15.1	12.1	4.0	10.0
Decatur	15.1	12.6	4.0	10.0
Joliet	15.1	12.6	4.0	10.0
Peoria	15.1	13.1	4.0	10.0
Quincy	14.9	12.9	4.0	8.7
Davenport, Ia.	15.1	13.6	4.0	†10.0
Des Moines	14.9	13.4	4.0	‡9.8
Mason City	15.3	13.8	4.0	‡10.2
Duluth, Minn.	16.9	15.4	5.0	10.8
Mankato	16.5	15.0	5.0	9.4
Minneapolis	16.5	15.0	5.0	10.4
LaCrosse, Wis.	16.5	15.0	5.0	10.4
Green Bay	16.9	15.0	5.0	10.3
Milwaukee	14.9	13.4	5.0	10.2
Detroit, Mich.	13.1	11.6	4.0	7.1
Grand Rapids	14.0	12.5	4.0	9.7
Saginaw	15.8	13.1	4.0	9.3
Evansville, Ind.	16.6	15.1	5.0	†10.5
Indianapolis	16.8	15.3	5.0	†10.0
South Bend	17.1	15.6	5.0	†9.0
Fargo, N. D.	16.7	15.2	4.0	11.6
Huron, S. D.	17.0	15.5	5.0	10.9
Kans. City, Mo.*	14.4	12.4	4.0	8.0
St. Louis*	14.2	12.7	4.0	8.0
St. Joseph	14.4	12.0	4.0	8.16
Wichita, Kans.	13.9	11.1	4.0	7.4

*State tax 2 cents, 1-cent city tax and 1-cent federal tax. †Does not include 4-cent state tax. ‡Does not include 3-cent state tax.

Exclusive of state general sales taxes.

Discounts to commercial consumers: On purchases per month off tank-wagon prices: 1,000 gallons or more, 1.5 cents off; minimum delivery 25 gallons.

Stanolex Fuel Oil in Chicago

Effective February 15, 1939, f.o.b. Chicago tank-wagon prices: Standard range oil, 1-99 gallons, 9 cents; 100-149 gallons, 8 cents; 150 gallons and over, 7.5 cents. Stanolex fuel oil No. 1, 1-149 gallons, 8.25 cents; 150-399 gallons, 7.25 cents; 400 gallons and over, 6.75 cents. Stanolex furnace oil, 1-149 gallons, 8.25 cents; 150-399 gallons, 7.25 cents; 400 gallons and over, 6.75 cents. Stanolex Grade A, 1-399 gallons, 5 cents; 400 gallons and over, 4 cents. Stanolex Grade B, 1-799 gallons, 4.75 cents; 800 gallons and over, 3.75 cents.

Ohio

STANDARD OIL CO. OF OHIO

	Gasoline Tank-wag. con'r.	Gasoline Di-vided dlr.	Gasoline Inc. tax	Kero. tank-wag.
Ohio points	16.0	15.0	5.0	*13.0

*Includes state tax of 1 cent.

Southern District

STANDARD OIL CO. (KENTUCKY)

	Gasoline Cons'r tank-wag.	Gasoline Net dlr.	Gasoline Inc. tax	Kero. tank-wag.
Atlanta, Ga.	18.5	15.5	7.0	8.5
Augusta	19.5	16.5	7.0	10.0
Macon	20.0	17.0	7.0	10.0
Savannah	17.5	14.5	7.0	8.0
Birmingham, Ala.	20.0	17.0	8.0	8.5
Mobile	21.0	18.0	9.0	8.5
Montgomery	21.0	19.0	9.0	10.5
Jackson, Miss.	17.5	14.5	7.0	9.5
Vicksburg	19.0	16.0	7.0	9.0
Jacksonville, Fla.	19.0	16.0	8.0	8.0
Miami	19.0	16.0	8.0	8.0
Pensacola	20.0	17.0	9.0	8.0
Tampa	19.0	16.0	8.0	8.0
Lexington, Ky.	19.0	16.0	6.0	10.0
Covington	17.5	14.5	6.0	9.5
Louisville	17.5	14.5	6.0	9.0
Paducah	18.5	15.5	6.0	9.0

Price basis to tank-wagon consumers: Effective January 4, 1937; 3 cents per gallon below tank-wagon price. Effective June 4, 1938, 2 cents per gallon discount eliminated from all kerosene markets in Mississippi, Alabama, Georgia, and Florida, markets being reduced correspondingly to a net basis.

Montgomery, Ala., has a county tax of 1 cent per gallon, and a city tax of 1 cent per gallon on gasoline, in addition to state tax and 1 cent per gallon on kerosene. Mobile, Ala., has a city gasoline tax of 2 cents per gallon; Birmingham, Ala., has a city gasoline tax of 1 cent per gallon; Pensacola, Fla., has a city gasoline tax of 1 cent.

Atlantic Coast District

STANDARD OIL CO. OF NEW JERSEY

	Gasoline Cons. tank-car	Gasoline Dlr. tank-wag.	Gasoline Inc. tax	Kero. tank-wag.
Atl'tic City, N. J.	10.9	12.7	4.0	7.0
Newark	10.9	12.7	4.0	7.0
Annapolis, Md.	12.85	14.35	5.0	9.5
Baltimore	12.25	13.75	5.0	7.0
Cumberland	13.65	16.15	5.0	10.0
Wash'gton, D. C.	10.50	12.0	3.0	9.5
Danville, Va.	14.45	16.95	6.0	12.9
Norfolk	13.25	15.75	6.0	11.5
Petersburg	13.55	16.05	6.0	11.7
Richmond	13.55	16.05	6.0	8.7
Roanoke	14.75	17.25	6.0	11.0
Charles'n, W. Va.	14.05	16.55	6.0	12.6
Parkersburg	13.35	14.85	6.0	11.2
Wheeling	14.35	15.75	6.0	12.2
Charlotte, N. C.	15.65	18.15	7.0	12.1
Hickory	16.15	18.65	7.0	12.5
Mt. Airy	15.95	18.45	7.0	12.3
Raleigh	15.25	17.75	7.0	11.6
Salisbury	15.75	18.25	7.0	12.2
Charleston, S. C.	14.25	16.75	7.0	10.6
Columbia	15.25	17.75	7.0	11.6
Spartanburg	15.95	18.45	7.0	12.4

Price basis to Essolene undivided dealers: Dealer tank-wagon price less .5 cent per gallon. Price basis to commercial consumers, effective March 8, 1937, in Maryland, District of Columbia, and in Arlington and Fairfax counties in Virginia; and March 12 in New Jersey: To contract accounts purchasing at least one full compartment at time by hose connection, on yearly purchases: From 2,500 to 100,000 gallons, consumer tank-wagon price at time and place of delivery; 100,000 gallons per year, consumer tankcar price plus .5 cent per gallon. Consumer tank-wagon price generally will be equivalent to dealer tank-wagon price less .5 cent per gallon.

Effective January 16, 1939, in North Carolina the commercial consumer schedule became as follows: Single deliveries of 50 gallons or more, consumer tank-wagon price. Single deliveries of less than 50 gallons, 4 cents per gallon over consumer tank-wagon price. Generally the posted consumer tank-wagon price will be equivalent to the dealer price, less .5 cent per gallon. The above policy also applies in South Carolina effective January 23, 1939.

Discounts for kerosene, 1 cent off tank-wagon price for 25 gallons or more under contract (contract not necessary in Baltimore) except no discount in New Jersey.

Pacific Coast Territory

STANDARD OIL CO. OF CALIFORNIA

	Gasoline Tank-wag.	Gasoline Serv. sta.	Gasoline Inc. tax	Kero. tank-wag.
San Francisco	17.5	18.5	4.0	11.5
Los Angeles	17.0	18.0	4.0	10.0
Fresno, Calif.	18.5	19.5	4.0	12.5
Phoenix, Ariz.	21.5	22.5	6.0	*17.5
Reno, Nev.	20.5	21.5	5.0	13.5
Portland, Ore.	20.0	21.0	6.0	13.5
Seattle, Wash.	20.0	21.0	6.0	13.5
Spokane	23.0	24.0	6.0	16.5
Tacoma	20.0	21.0	6.0	13.5

*Includes 5-cent state tax.

Discounts to dealers: On gasoline, off tank-wagon price, to 100 per cent dealers, 3 cents. To commercial consumers: On tank-wagon price; on single deliveries of 40 gallons and over, advance quantity discount extended at time of delivery, 3 cents. Service station schedule applies on single deliveries less than 40 gallons. On kerosene in tankcar, transport truck and trailer delivery, 3 cents off tank-wagon price; plant deliveries to jobbers, 2.5 cents below tank-wagon.

March 18, 1939, split dealer discount was canceled.

Pennsylvania, Delaware, and Part of New England

ATLANTIC REFINING CO.

	Gasoline Cons. tank-car	Gasoline Dlr. tank-wag.	Gasoline Inc. tax	Kero. tank-wag.
Philadelphia, Pa.	12.0	13.0	5.0	10.0
Pittsburgh	13.0	15.0	5.0	10.5
Allentown	12.75	14.25	5.0	10.5
Erie	13.0	14.5	5.0	10.0
Scranton	13.0	14.5	5.0	10.5
Altoona	13.0	15.0	5.0	10.5
Dover, Del.	...	13.5	5.0	10.5
Wilmington	...	12.5	5.0	9.75

Price basis to undivided dealers, dealer tank-wagon price less .5 cent per gallon. Price basis to commercial consumers in Pennsylvania and Delaware, effective March 11, 1937: Consumers under contract using 100,000 gallons or more per year full compartment hose deliveries, tankcar plus .5 cent. Consumers under contract using less than 100,000 gallons per year compartment hose deliveries, undivided dealer price. Consumers under contract less than full compartment delivery, consumers not under contract, less than full compartment delivery, and consumers not under contract full compartment delivery, divided dealer price. Less than 25 gallons, tank-wagon delivery, 4 cents per gallon above undivided dealer price.

New York and New England

SOCONY-VACUUM OIL CO., INC.

	Gasoline Cons. tank-car	Gasoline Dlr. tank-wag.	Gasoline Inc. tax	Kero. tank-wag.
Albany	11.5	13.5	5.0	7.25
*Met. N. Y.:				
Manhat., Bronx	11.5	12.4	5.0	7.0
Queens, Br'klyn	11.5	12.4	5.0	7.0
Staten Island	11.5	12.9	5.0	7.0
Buffalo	12.0	11.8	5.0	7.0
Rochester	12.25	12.75	5.0	8.0
Syracuse	12.0	14.0	5.0	7.5
Boston, Mass.	10.25	12.0	4.0	6.75
Portland, Me.	11.5	13.5	5.0	7.0
Manchester, N.H.	12.1	14.1	5.0	7.5
Burlington, Vt.	12.0	13.5	5.0	7.5
Springfield, Mass.	10.75	12.8	4.0	7.25
Worcester	10.75	12.8	4.0	7.25
Hartford, Conn.	10.75	12.8	4.0	6.50
New Haven	10.75	12.5	4.0	6.00
Providence, R. I.	10.25	12.3	4.0	6.75

*Does not include 2 per cent city sales tax which is calculated on basis of net retail price exclusive of state and federal taxes. Metropolitan New York prices are undivided dealer prices; others are split dealer.

Effective February 15, 1939, the company changed its commercial consumer policy in New York and New England points for tank-wagon delivery to the following: Annual purchases 10,000 gallons and under, tankcar price plus 2 cents per gallon; annual purchases 10,000 gallons up to 50,000 gallons, tankcar price plus 1.5 cents per gallon; annual purchases 50,000 to 200,000 gallons, tankcar price plus 1 cent per gallon; annual purchases 200,000 gallons and over, tankcar price plus one-half cent per gallon. Private consumers will pay undivided dealer price, plus 2 cents per gallon. Private consumers receiving full compartment deliveries of at least 200 gallons will receive a discount of one-half cent per gallon.

Rocky Mountain District

CONTINENTAL OIL CO.

	Gasoline Dealer	Gasoline Inc. tax	Kero. tank-wag
Denver, Colo.	15.5	5.0	11.5
Grand Junction	18.0	5.0	15.0
Pueblo	14.0	5.0	10.5
Casper, Wyo.	17.0	5.0	11.5
Cheyenne	15.0	5.0	13.0
Billings, Mont.	18.0	6.0	13.0
Butte	19.5	6.0	15.5
Great Falls	18.0	6.0	15.5
Helena	19.0	6.0	15.5
Salt Lake City, Utah	17.0	5.0	16.0
Boise, Idaho	†20.1	6.0	18.0
Twin Falls	†20.6	6.0	18.0
Albuquerque, N. M.	16.5	*6.5	10.0

*Includes city tax of .5 cent. †Includes state tax of 1 mill.

Central South District

STANDARD OIL CO. OF LOUISIANA

	Gasoline Cons. tank-car	Gasoline Dlr. tank-wag.	Gasoline Inc. tax	Kero. tank-wag.
New Orleans, La.	16.75	19.25	*10.0	†11.0
Baton Rouge	14.75	17.25	8.0	†10.5
Alexandria	14.75	17.25	8.0	‡12.5
Lafayette	15.00	17.50	8.0	‡12.5
Lake Charles	14.75	17.25	8.0	‡12.5
Shreveport	13.50	16.00	8.0	†11.0
Knoxville, Tenn.	18.00	20.50	8.0	14.5
Memphis	16.00	18.50	8.0	12.5
Chattanooga	17.50	19.00	8.0	14.0
Nashville	17.00	17.50	8.0	12.0
Bristol	18.25	19.25	8.0	14.5

Essolene at dealer price less .5 cent per gallon to undivided dealers.

*Includes 2-cent parish tax. †Includes 1-cent parish tax and 1-cent state tax. ‡Includes 1-cent state tax.

Price basis to commercial consumers: Effective May 15, 1937, deliveries of 50 gallons or more in one territory take posted consumer tank-wagon price. Accounts taking deliveries of less than 50 gallons at one time pay posted consumer tank-wagon price plus 4 cents per gallon. Generally, the posted consumer tank-wagon price will be equivalent to the dealer price less .5 cent per gallon. Kerosene prices include 1-cent state tax.

Effective February 24, 1939, the company reestablished in New Orleans the commercial consumer policy on motor fuel effective in the rest of the state.

Effective December 12, 1938, the company revised its commercial consumer policy on motor fuel in New Orleans, as follows: Single deliveries of less than 50 gallons, consumer tankcar plus 2 cents per gallon; 50 to 199 gallons, consumer tankcar plus 1 cent per gallon; 200 gallons and over, consumer tankcar plus .5 cent per gallon.

Nebraska

STANDARD OIL CO. OF NEBRASKA

	Gasoline Tank-wag.	Gasoline Dlr.	Gasoline Inc. tax	Kero. tank-wag.
Omaha	17.5	15.0	6.0	10.3
McCook	17.5	15.5	6.0	10.0
Norfolk	17.9	17.9	6.0	10.7
North Platte	18.3	15.9	6.0	11.1
Scottsbluff	17.0	14.9	6.0	11.0

Discounts to commercial consumers for tank-wagon deliveries covered only by standard commercial consumers contract, effective January 1, 1935.

Oklahoma and Arkansas

CONTINENTAL OIL CO.

	Gasoline Dealer	Gasoline Inc. tax	Kero. tank-wag.
Texarkana, Ark.	12.0	5.0	8.0
Fort Smith	13.25	5.0	7.5
Little Rock	16.75	7.5	8.0
Muskogee, Okla.	13.0	5.0	7.0
Oklahoma City	11.0	5.0	6.5
Tulsa	11.0	5.0	6.5

Texas

	Gasoline Tank-wag.	Gasoline Serv. sta.	Gasoline Inc. tax	Kero. tank-wag.
Dallas, Tex.	11.0	15.0	5.0	7.0
Fort Worth	11.0	15.0	5.0	8.0
Houston	13.0	17.0	5.0	8.0
San Antonio	14.0	18.0	5.0	8.0

Naphtha

STANDARD OIL CO. (INDIANA)

	Tank-wagon*
Oleum spirits	15.7
V.M.&P. naphtha	16.0
Cleaners' naphtha	15.0
Stanisol	15.0

*Prices include 3-cent Illinois tax but not 1-cent federal tax or 2 per cent retail occupational tax.

Prices f.o.b. Chicago. Each price subject to discount of 1 cent per gallon for 150-gallon lots if covered by contract.

Canada*

3-Star Imperial Gasoline
IMPERIAL OIL, LTD.

	Tank-wag.	Inc. tax	Kero. tank-wag.
Halifax, N. S.	23.5	10.0	17.5
St. John, N. B.	23.5	10.0	17.5
Montreal, Que.	20.0	6.0	14.5
Toronto, Ont.	21.0	6.0	15.5
Hamilton, Ont.	21.0	6.0	15.5
Winnipeg, Man.	26.5	7.0	20.5
Brandon, Man.	28.0	7.0	22.0
Regina, Sask.	26.0	7.0	22.0
Saskatoon, Sask.	28.3	7.0	24.9
Edmonton, Alta.	26.5	7.0	21.5
Calgary, Alta.	23.5	7.0	19.0
Vancouver, B. C.	23.0	7.0	23.0

*Imperial gallon used in Canada.

Divided dealers pay tank-wagon prices. Discount to undivided dealers, 1 cent below tank-wagon price. In maritime provinces both divided and undivided dealers pay tank-wagon price.

Tank-Wagon Changes

Standard Oil Co. (Nebraska) March 29 reduced tank-wagon and dealer gasoline and tank-wagon kerosene .5 cent in McCook; reduced tank-wagon and dealer gasoline .6 cent and tank-wagon kerosene .7 cent in Scottsbluff; April 3, reduced dealer gasoline .5 cent in Norfolk.

Socony-Vacuum Oil Co., Inc., April 4 reduced dealer tank-wagon gasoline .3 cent in Albany.

Clenon C. Hemsel, district geologist for Columbia Fuel Corp., Amarillo, Tex., was to be the main speaker at a meeting of the Panhandle Geological Society Thursday, April 13, in Amarillo, his subject being geology of the Hugoton gas field and southwestern Kansas.

Prices of Refined Products

All quotations f.o.b. plant in cars for interstate or export movement except as otherwise noted

Prices as of April 11, 1939

The following quotations are exclusive of the federal excise taxes of 1 cent a gallon on gasoline and 4 cents a gallon on lubricating oils.

Refinery Gasoline

OKLAHOMA (Group 3)—

U. S. Motor grades:		
62 octane and below	.03⅞	.04
63-66 octane	.04⅛	.04¼
67-69 octane	.04⅜	.04½
70-72 octane (regular)	.04⅝	.04¾
60-62 400 grades:		
62 octane and below	.03⅞	.04
63-66 octane	.04¼	.04¼
67-69 octane	.04⅜	.04½
70-72 octane (regular)	.04⅝	.04¾
64-66 375	.04	.04½
68-70 360	.05	.05⅛

NORTH TEXAS—

U. S. Motor grades:		
62 octane and below	.03⅞	.04
63-66 octane	.04⅛	.04¼
67-69 octane	.04⅜	.04½
70-72 octane (regular)	.04⅝	.04¾
60-62 400	.03¾	.03⅞
64-66 375	.04	.04⅛

NORTH LOUISIANA (Ark. and N. La. delivery)—

U. S. Motor grades:		
62 octane and below	.04¼	.04⅜
63-66 octane	.04⅜	.04⅝
67-69 octane	.04⅝	.04⅞
70-72 octane (regular)	.05⅛	.05¼

ARKANSAS (Ark. and N. La. del.)—

U. S. Motor grades:		
62 octane and below	.04	.04⅛
67-69 octane	.04⅛	.04⅜

CHICAGO (Based on Group 3)—

U. S. Motor grades:		
62 octane and below	.03⅞	.04
63-66 octane	.04⅛	.04¼
67-69 octane	.04⅜	.04½
70-72 octane	.04⅝	.04¾
60-62 400 grades:		
62 octane and below	.03⅞	.04
63-66 octane	.04⅛	.04¼
67-69 octane	.04⅜	.04½
70-72 octane	.04⅝	.04¾
64-66 375	.04	.04¼
68-70 360	.05	.05¼

PENNSYLVANIA (inland refineries)—

58-60 U. S. Motor:		
Below 60 octane		.04½
65 octane		.06¼
68-70 octane		.06½

CALIFORNIA (domestic movement)—

54-58 U. S. Motor	.06	.08
58-60 400, 65 oct. and higher	.07½	.09

EAST COAST (domestic)—

U. S. Motor, 65 and above:		
*New York (Bayonne)	.06	.06¼
Philadelphia	.06	.06¼
Baltimore	.06	.06¼
Charleston, S. C.	.06½	.06¾

*All grades of gasoline one-eighth to one-fourth cent less for barge shipments. New York Harbor prices are for New York and New England delivery. Prices for New Jersey delivery one-fourth cent lower.

GULF COAST (domestic)—

U. S. Motor grades:		
Below 60 octane	.04¼	.04⅜
60-64.9	.04⅝	.04¾
65 octane and higher		.04¾
68-70	.04⅞	.05⅛

Naphtha

PENNSYLVANIA (inland refineries)—

52-56 450 (blending)	.04¼	.04½

Natural Gasoline

OKLAHOMA (Group 3)—

Grade 26-70		.02½
Grade 18-55	.03	.03⅛

NORTH TEXAS—

Grade 26-70		.02½
Grade 18-55	.02⅞	.03

CALIFORNIA—

75-85 375-390	.06½	.07

NORTH LOUISIANA (Ark. and N. La. delivery)—

Grade 26-70		.02⅞

Tractor Fuel

OKLAHOMA (Group 3)—

40-42 gr., 315-325 l.b.p., 110-flash, 540-550 e.p.	.03⅞	.04
41-43 gr., 300-320 l.b.p., 110-125 flash, 500-520 e.p.	.04	.04¼
46-48 gr., 210-230 l.b.p., 480-max., e.p.	.04⅝	.04⅝

Kerosene

(All kerosene water white)

OKLAHOMA (Group 3)—

41-43	.03⅞	.04
42-44	.04⅛	.04¼

NORTH TEXAS—

41-43	.04	.04⅛

NORTH LOUISIANA (Ark. and N. La. delivery)—

41-43	.04	.04⅜

ARKANSAS (Ark. and N. La. del.)—

41-43	.04¼	.04⅜

PENNSYLVANIA (inland refineries)—

45	.05	.05⅛
46	.05⅛	.05¼
47	.05¼	.05⅜

CHICAGO (Based on Group 3)—

41-43	.03⅞	.04¼
42-44	.04⅛	.04⅜

CALIFORNIA (Pac. Coast market)—

38-43 high burning test	.04¾	.05¾

NEW YORK (Bayonne, N. J.)—

41-43		.04¾

***GULF COAST (domestic)—**

41-43	.03⅝	.03⅞

*Barge price one-eighth cent lower.

Furnace Oil

OKLAHOMA (Group 3)—

Range oil	.03⅝	.03¾
No. 1 prime white, 38-42	.03½	.03⅝
No. 1 straw, 38-40	.03¼	.03⅜
No. 2 straw, 32-36	.03	.03⅛
No. 2 dark, 32-36	.02⅞	.03
No. 3 zero to 15, 28-32	.02¾	.02⅞
No. 3, 15 and above, 28-32	.02⅝	.02¾

NORTH TEXAS—

No. 1 prime white, 38-42	.03½	.03⅝
No. 1 straw, 38-40	.03¼	.03⅜

NORTH LOUISIANA (Ark. and N. La. delivery)—

No. 2, 32-36	.03⅜	.03⅝

ARKANSAS (Ark. and N. La. del.)—

No. 2, 32-36		.03⅝

CHICAGO (Based on Group 3)—

Range oil	.03¾	.03⅞
No. 1 prime white, 38-40	.03⅝	.03¾
No. 1 straw, 38-40	.03⅜	.03½
No. 2 straw, 32-36	.03¼	.03⅜
No. 2 dark, 32-36	.03⅛	.03¼
No. 3, zero to 15, 28-32	.03	.03⅛
No. 3, 15 and above, 28-32	.02¾	.02⅞

NEW YORK (Bayonne, N. J.)—

*No. 1	.04¼	.04⅜
*No. 2		.04
*No. 4		.04

*Barge deliveries one-eighth to one-fourth cent under above tankcar price.

Gas Oil and Fuel Oil

(Gas oil per gal., fuel oil per bbl.)

OKLAHOMA (Group 3)—

U.G.I. gas oil	.02⅝	.02¾
No. 4, low pourpoint, 24-28	.95	1.00
No. 4, 15 and above, 24-28	.85	.90
No. 5, low pourpoint, 18-22	.70	.75
Below 14 fuel oil, industrial	.45	.55

NORTH TEXAS—

U.G.I. gas oil	.02⅝	.02¾
No. 4, low pourpoint, 24-28	.95	1.00
No. 5, low pourpoint, 18-22	.70	.75
Below 14 fuel oil, industrial	.45	.55

NORTH LOUISIANA (Ark. and N. La. delivery)—

10-14 fuel oil, industrial	.70	.75

CHICAGO (Based on Group 3)—

U.G.I. gas oil	.02⅝	.02⅞
No. 4, low pourpoint, 24-28	1.00	1.10
No. 4, 15 and above, 24-28	.85	.95
No. 5, low pourpoint, 18-22	.70	.80
No. 5, 15 and above, 18-22	.60	.70
No. 6, low pourpoint, 10-16	.60	.70
No. 6, 15 and above, 10-16	.35	.45

PENNSYLVANIA (inland refineries)—

36-40	.04½	.04¾

CALIFORNIA—

Los Angeles:		
30-40 gas oil, per bbl.	1.15	1.35
24 plus Diesel, per bbl.	1.00	1.30
24 plus Diesel (bunkers)	1.15	1.50
12-16 (bunkers at tidewater)	.75	.90
10-16 (cargo lots)	.60	.80
12-17 (tankcars)	.50	.80
10-17 (high sulfur)	.45	.70
San Joaquin Valley:		
10-18 (tankcars)	.50	.80
24 plus Diesel, per bbl.	1.15	1.40
San Francisco:		
24 plus Diesel, per bbl.	1.40	1.45
24 plus Diesel (bunkers)	1.45	1.55
10-16 (bunkers)	.90	.95

GULF COAST—

No. 2 fuel	.03⅜	.03⅝
43-47 Diesel	.03¼	.03½
48-52 Diesel	.03½	.03⅝
53-57 Diesel	.03⅝	.03¾
Bunker C (bulk cargoes)	.72	.75
Bunker C (bunkers)		.75

NEW YORK (Bayonne, N. J.)—

27 plus, gas oil		.04
28-30 Diesel (lighterage 6¼c per bbl.)		1.65
28-30 Diesel (tankcars)	.04¼	.04½
Bunker C (to ocean-going ships in N. Y. Harbor)		.95
Industrial fuel (tankcars)		.03¼

Lighterage charge 5c bbl. additional.

Bright and Steam Refined

OKLAHOMA (Group 3)—

190-200 D, 15-25		.19
150-160 D, 0-10	.14¼	.16
150-160 D, 15-25	.13½	.15½
150-160 E, 15-25	.13	.15
100-110 D, 0-10		.14½
Steam refined:		
631 green (treated)		.12½
600 dark green (untreated)	.04½	.05

PENNSYLVANIA—

Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pourpoint	.17½	.18½
15 pourpoint	.16½	.17½
25 pourpoint	.15	.15½
Steam refined:		
600	.08½	.10
650	.10½	.11
600 flash	.11	.12
630 flash	.13½	.14

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—

150-3		.09
180-3		.10
180-4		.09½
200-3		.10½
200-4		.10
250-3		.11½
250-4		.11
280-3		.12½
280-4		.12
300-6½		.13
400-3½		.14
100-2½ paraffin oil 15-20 pourpoint:		.06
200-3		.10
200-4		.09½
250-3		.11
250-4		.10½
280-3		.12
280-4		.12½

GULF COAST—

Pale oils:		
200-3	.07	.07¼
300-3	.07½	.07⅝
500-3½	.08½	.08⅝
750-3½	.08⅝	.09¼
1,200-3½	.09½	.09¾
1,500-4	.09¾	.10
Red oils:		
200-5-6	.07¼	.07½
300-5-6	.07¼	.07½
500-5-6	.08	.08½
750	.08¾	.09
1,200-5-6	.09¼	.09½

CALIFORNIA (moving to dom. market)—

Pale oils:		
100-2½-3	.07¼	.08
200-2½-3	.07¼	.08
300-2½-3	.07¼	.08
400-3-4	.07¼	.08
450-3-4	.07¼	.08
550-3-4	.09	.11
600-3-4	.09	.11
Red oils:		
200-4-5	.07¼	.08
300-5-6	.07¼	.08
350-5-6	.09¼	.11½
400-5-6	.09¼	.11½
450-5-6	.09¼	.11½
500-5-6	.09¼	.11½
600-5-6½	.09¼	.11½
700-6½ plus	.09¼	.11½
750-6½ plus	.09¼	.11½
900-6½ plus	.09¼	.11½

PENNSYLVANIA—

150 vis. at 70° F., 3 color, 400-405 flash:		
Zero pourpoint	.18½	.19
10 pourpoint	.18	.18½
15 pourpoint	.16½	.17
25 pourpoint	.15	.15½
200 vis. at 70° F., 3 color:		
Zero pourpoint	.19½	.20
10 pourpoint	.19	.19½
15 pourpoint	.18½	.19
25 pourpoint	.17	.17½

Wax and Petrolatum

(Prices per pound)

OKLAHOMA (Group 3)—

124-126 (a.m.p.) w.c. scale		.0275

PENNSYLVANIA (inland refineries)—

122-124 (a.m.p.) w.c. scale	.0255	.0260
124-126 (a.m.p.) w.c. scale	.0260	.0265

NEW YORK—

Wax in bags fully refined:		
122-125 (a.m.p.) wax		.0350
125-127 (a.m.p.) wax		.0360
128-130 (a.m.p.) wax		.0375
130-132 (a.m.p.) wax		.0435
133-135 (a.m.p.) wax		.0465
135-137 (a.m.p.) wax		.0490
124-126 (a.m.p.) w.s.	.0255	.0260
124-126 (a.m.p.) y.s.	.0250	.0255
Petrolatum in barrels, carload lots:		
Dark green	.02	.02⅛
Amber	.02⅜	.02⅛
Extra amber	.02⅝	.02¾
Lily white	.05⅛	.05¼
Snow white	.06¼	.06¼
Cream	.04¼	.04¼

Export Prices

GASOLINE

GULF COAST—

U. S. Motor	.04¼	.04⅜
60-62 400	.04¼	.04⅜
61-63 390	.04⅜	.04⅝
64-66 375	.04½	.04⅝

LOS ANGELES—

U. S. Motor grades:		
55-65 octane	.04½	.04¾
65-69 octane	.04¾	.05
Above 69 octane	.05	.05½

KEROSENE

GULF COAST—

41-43 prime white	.03⅝	.03⅞
41-43 water white	.03⅝	.03⅞

LOS ANGELES—

41-43 water white	.05	.05¼

LUBRICANTS

(Pennsylvania Grade)

NEW YORK (f.a.s. in bbls.)—

Cylinder stocks:		
600 Warren E	.15	.15½
600 S.R. unfiltered	.16	.16½
630 S.R. unfiltered	.17	.17½
600 flash, S.R.	.17	.17½
630 flash, S.R.	.20½	.21
Bright stocks:		
8 color	.16¼	.16½

NEUTRAL OIL

200-3 color	.21½	.22
150-3 color	.19½	.20

PARAFFIN WAX

NEW YORK (prices per pound)—

123-125 a.m.p.		.0375
125-127 a.m.p.		.0387
128-130 a.m.p.		.0412
133-135 a.m.p.		.0437
135-137 a.m.p.		.0455
Crude scale:		
124-126 w.s.	.0255	.0260
124-126 y.s.	.0255	.0260

Crude Oil Prices

Oklahoma, Kansas, North Central and East Central Texas

East Texas (Oct. 11, 1938)* $1.10
Van, Tex. (Oct. 11, 1938)* ..... .93
Talco, Tex. (Oct. 11, 1938)* ..... .55
Rodessa, Tex. .....
See North Louisiana gravity schedule
Cass and Panola counties, Texas
.....See gravity schedule
Altus and Tipton†.....See note below
Cayuga, Tex. (Feb. 15, 1939) ..... .68
Clay Creek, Tex. ..... .85

*Humble Oil & Refining Co. †Gulf Refining Co. Pure Oil Co.'s Van price, 93 cents, effective Oct. 13, 1938.

Altus and Tipton, Okla., starting at below 25 degrees at 71 cents, 2-cent spread to 40 degrees and above at $1.03. East Texas price met by all buyers posting prices. Talco price adopted by Talco Pipe Line on October 11. Cayuga posted by Pan American Pipe Line Co. Clay Creek posted by Sun Oil Co.

Southwest Texas

Salt Flat, Darst Creek, Hilbig, Carroll, Clark and Zoboroski (Oct. 11, 1938)* ..... $ .96
Pettus (Oct. 11, 1938)* 1.29
Flour Bluff (Dec. 3, 1938)* 1.23
Darst Creek (Oct. 12, 1938)† ..... .96
Darst Creek and Bruner (Oct. 13, 1938)‡ ..... .96

Crude Prices by Gravities

	1 Oklahoma	2 Oklahoma and Kansas	3 North and Central Texas	4 Louisiana and Arkansas	5 East Central Texas	6 Gray County, Texas	7 Hutchinson and Carson counties, Texas	8 Raccoon Bend, Satsuma and Tomball, Texas	9 West Texas and Lea County, N. M.	10 Fort Collins and Wellington, Colo.	11 Anahuac and Dickinson, Mirando, Duval, Texas.	12 Refugio, Texas	13 Gulf Coast Texas	14 Cass and Panola counties, Texas	15 Beaumont and West Beaumont, Texas	16 Lockport, Iowa, Cameron Meadows, Louisiana	17 Artesia, Jackson and Maljamar, N. M.	18 Iowa, Louisiana
Below 18	....	....	....	....	....	....	....	....	$.53	....	$.74	$.79	$.79	....	....	$.74	....	$.75
18-18.9	....	....	....	....	....	....	....	....	.53	....	.74	.79	.79	....	....	.76	....	.77
19-19.9	....	....	....	....	....	....	....	....	.53	....	.74	.79	.79	....	$.79	.78	....	.79
20-20.9	$.60	$.70	....	....	....	....	....	....	.55	....	.77	.82	.82	....	.82	.80	....	.81
21-21.9	.63	.72	....	....	....	....	....	....	.57	....	.80	.85	.85	....	.85	.82	....	.83
22-22.9	.66	.74	....	....	....	....	....	$.95	.59	....	.83	.88	.88	....	.88	.85	....	.86
23-23.9	.69	.76	....	....	$.78	....	....	.97	.61	....	.86	.91	.91	....	.91	.88	....	.89
24-24.9	.72	.78	$.71	....	.80	....	....	.99	.63	....	.89	.94	.94	....	.94	.91	....	.92
Below 25	....	....	....	$.73	....	....	....	....	....	....	....	....	....	$.73	....	....	....	....
25-25.9	.75	.80	.73	.75	.82	....	....	1.01	.65	....	.92	.97	.97	.75	.97	.94	....	.95
26-26.9	.78	.82	.75	.77	.84	....	....	1.03	.67	....	.95	1.00	1.00	.77	1.00	.97	....	.98
27-27.9	.81	.84	.77	.79	.86	....	....	1.05	.69	....	.97	1.02	1.02	.79	1.02	.99	....	1.00
28-28.9	.84	.86	.79	.81	.88	$.72	$.67	1.07	.71	$.81	.99	1.04	1.04	.81	1.04	1.01	$.61	1.02
29-29.9	.87	.88	.81	.83	.90	.74	.69	1.09	.73	.83	1.01	1.06	1.06	.83	1.06	1.03	.63	1.04
Below 30	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
30-30.9	.90	.90	.83	.85	.92	.76	.71	1.11	.75	.85	1.03	1.08	1.08	.85	1.08	1.05	.65	1.06
31-31.9	.92	.92	.85	.87	.94	.78	.73	1.13	.77	.87	1.05	1.10	1.10	.87	1.10	1.07	.67	1.08
32-32.9	.94	.94	.87	.89	.96	.80	.75	1.15	.79	.89	1.07	1.12	1.12	.89	1.12	1.09	.69	1.10
33-33.9	.96	.96	.89	.91	.98	.82	.77	1.17	.81	.91	1.09	1.14	1.14	.91	1.14	1.11	.71	1.12
34-34.9	.98	.98	.91	.93	1.00	.84	.79	1.19	.83	.93	1.11	1.16	1.16	.93	1.16	1.13	.73	1.14
Below 35	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
35-35.9	1.00	1.00	.93	.95	1.02	.86	.81	1.21	.85	.95	1.13	1.18	1.18	.95	1.18	....	.75	....
36-36.9	1.02	1.02	.95	.97	1.04	.88	.83	1.23	.87	.97	1.15	1.20	1.20	.97	1.20	....	.77	....
37-37.9	1.04	1.04	.97	.99	1.06	.90	.85	1.25	.89	.99	1.17	1.22	1.22	.99	1.22	....	.79	....
38-38.9	1.06	1.06	.99	1.01	1.08	.92	.87	1.27	.91	1.01	1.19	1.24	1.24	1.01	1.24	....	.81	....
39-39.9	1.08	1.08	1.01	1.03	1.10	.94	.89	1.29	.93	1.03	1.21	1.26	1.26	1.03	1.26	....	.83	....
40 and over	1.10	1.10	1.03	1.05	1.12	.96	.91	1.31	.95	1.05	1.23	1.28	1.28	1.05	1.28	....	.85	....

Column 1—Magnolia Petroleum Co., effective October 12, 1938. Shell Petroleum Corp., effective October 22, 1938. Shell Oil Co., Inc., April 1, 1939.

Column 2—Standard Oil Co. of Indiana, effective October 11, 1938, below 29 degrees 86 cents, with 2-cent spread to 40 and over at $1.10. Same company on October 17 revised the schedule to start at below 21 degrees at 70 cents, with 2-cent spread to 40 and over at $1.10. Sinclair Prairie Oil Marketing Co. schedule started at below 25 degrees, 60 cents; 25-25.9, 80 cents with 2-cent differential up to $1.10 for 40 degrees and over, effective October 11, but was revised on October 14, starting at 21 gravity, 60 cents, with a 3-cent spread to 30-30.9 degrees at 90 cents, then a 2-cent spread to 40 degrees and over at $1.10. Gulf Oil Corp. schedule starts at below 25 degrees, 78 cents, with 2-cent differential up to $1.10 for 40 degrees and over, effective October 13. Shell Petroleum Corp. schedule same as that of Gulf, effective October 13 to October 21 (see Column 1). The Texas Co. schedule starts at 28-28.9 degrees, 86 cents, with top of $1.10 for 40 degrees and over. Pure Oil Co. same as Standard of Indiana's October 11 schedule, effective October 14.

Column 3—Humble Oil & Refining Co. in Central Texas, effective December 3, 1938. Magnolia Petroleum Co. schedule in North and Central Texas, same as the Humble, excepting that it starts at below 29 degrees at 79 cents, effective December 3, 1938. The Texas Co. schedule in North and Central Texas, same as Magnolia's, but effective October 12. Gulf Refining Co. same as the Texas Co., effective October 13. Sinclair Prairie Oil Marketing Co., in Mexia and North Central Texas, below 29 degrees, 76 cents, with 2 cents added for each degree up to and including 40 and over at $1. effective October 11. Stanolind Oil Purchasing Co. schedule started at below 29 degrees at 79 cents with a top of $1.03 for 40 degrees and over, effective October 11, but was revised on October 17 to read below 21 degrees, 60 cents with a 2-cent spread to 40 degrees and over at $1.

Column 4—Standard Oil Co. of Louisiana, effective October 5, 1938. Met by Gulf Refining Co. October 13; met by Texas Co. October 12.

Column 5—Humble Oil & Refining Co., October 11, 1938.

Column 6—Humble Oil & Refining Co., effective December 3, 1938. Sinclair Prairie Oil Marketing Co., October 11, 1938. Texas Co. quotes "Panhandle sweet crude," beginning with 34-34.9 degrees, at 84 cents, with 2-cent spread to 40 and over at 96 cents, and "Panhandle sour crude," 79 cents for 34-34.9 degrees, with a top of 91 cents for 40 degrees and over, effective October 12. Magnolia Petroleum Co. met Humble prices throughout, effective December 3. Gulf Refining Co. quotes "Panhandle sweet crude" at below 29 degrees, 72 cents with a 2-cent spread, and a top price of 96 cents for 40 degrees and above, and "Panhandle sour crude" below 29 degrees, 67 cents, with a top of 91 cents for 40 degrees and above effective October 13. Phillips Petroleum Co. schedule for sweet crude in the Gray, Carson and Hutchinson counties, starts at below 29 degrees, 72 cents, with a spread of 2 cents up to 96 cents for 40 degrees and over, effective February 7, 1939.

Column 7—Humble Oil & Refining Co., effective December 3, 1938. Sinclair Prairie Oil Marketing Co., October 11, 1938. Texas Co. quotes "Panhandle sweet crude" at 34-34.9 degrees, 84 cents, with a top of 96 cents for 40 gravity, and "Panhandle sour crude" at 34-34.9 degrees, 79 cents, with a top of 91 cents for 40 degrees and over, effective October 12. Gulf Refining Co. quotes "Panhandle sweet crude" at below 29 degrees, 72 cents, with a top of 96 cents for 40 degrees and over and "Panhandle sour crude" at below 29 degrees, 67 cents, with a top of 91 cents for 40 degrees and above, effective October 13. Phillips Petroleum Co. schedule for sour crude in Carson, Moore and Hutchinson counties, starts at below 29 degrees at 67 cents, with a spread of 2 cents up to 91 cents for 40 degrees and over, effective February 7, 1939.

Column 8—Humble Oil & Refining Co., effective October 11, 1938. Magnolia Petroleum Co., in Tomball, effective October 12.

Column 9—Humble Oil & Refining Co., effective October 11, 1938. The Texas Co. schedule starts below 26 degrees, 65 cents, and ends at 36 degrees and over at 87 cents, effective October 12. Gulf Refining Co. starts at below 26 degrees at 65 cents and ends at 40 degrees and over at 95 cents, effective October 13. Magnolia Petroleum Co. schedule starts below 25 degrees, 63 cents, and ends at 40 degrees and above at 95 cents, effective October 12. Sinclair Prairie Oil Marketing Co. schedule same as that of Magnolia, effective October 11 but revised on March 24, 1939, to stop at 36 degrees and over at 87 cents. Stanolind Oil Purchasing Co. schedule same as that of Humble, effective October 11. Stanolind Oil & Gas Co. (Winkler County) starts at below 26 degrees, 65 cents, with a 2-cent spread, and a top of 95 cents for 40 degrees and above, effective October 11.

Column 10—Continental Oil Co., effective October 11, 1938.

Column 11—Gulf Refining Co. in Anahuac, effective October 12, 1938. By Humble Oil & Refining Co. in Anahuac, Dickinson and Mirando, effective December 3, 1938; by the Texas Co. in Mirando and Duval but starting at below 21 degrees, 77 cents, with a 2-cent spread up to and including 28 and above at 99 cents, effective October 12, 1938.

Column 12—Humble Oil & Refining Co., effective December 3, 1938. The Texas Co. starting at below 21 degrees at 81 cents and stopping at 28 and above at $1.04, October 13, 1938.

Column 13—Posted by Humble Oil & Refining Co., effective October 11, 1938. Pure Oil Co., October 13, starting at below 20 degrees, 79 cents. The Texas Co. schedule in coastal Texas and Louisiana, starts at below 21 degrees, 82 cents, with 3-cent differential up to 26-26.9 at $1 and then a 2-cent differential to top of $1.16 for 34 degrees and above, effective October 12. Gulf Refining Co. schedule on Louisiana Gulf Coast starts at below 18 gravity, 76 cents, with 2-cent spread to 20-20.9 degrees at 82 cents, then a 3-cent spread to 26-26.9 degrees at $1, then 2-cent spread to a top of $1.16 for 34 degrees and over, effective October 12. Sun Oil Co. met Humble prices October 13, stopping at 34 degrees and over at $1.16.

Column 14—Magnolia Petroleum Co., effective October 12, 1938.

Column 15—Standard Oil & Gas Co. in West Beaumont, effective October 11, 1938, and Magnolia Petroleum Co. in Beaumont field, effective October 12.

Column 16—Magnolia Petroleum Co., effective October 12, 1938.

Column 17—Continental Oil Co., effective October 11, 1938.

Column 18—Shell Petroleum Corp., October 11, 1938. Shell Oil Co., Inc., April 1, 1939.

Luling (Oct. 12, 1938)† ..... .87
Lytton Springs (Oct. 12, 1938)† .... .99
Mirando (Oct. 12, 1938)† ....
Government Wells (Oct. 13, 1938)
.....See note below

*Humble Oil & Refining Co. †Magnolia Petroleum Co. Pettus price adopted by Atlantic Crude Oil Purchasing Co. ‡Gulf Refining Co.

Government Wells posted by Sun Oil Co. starts at 20 gravity, 77 cents, 3-cent spread to 24-24.9 at 89 cents.

Gulf Coast

Conroe, Tex. (Oct. 11, 1938)* $1.27
Black Bayou and White Castle, La. (Oct. 11, 1938)†.....See note below
Gibson, La. (Oct. 11, 1938)† 1.04
Garden Island, La. (Oct. 12, 1938)‡. 1.24
Lafitte, La. (Oct. 12, 1938)‡..... 1.04
Cleveland, Tex. (Oct. 12, 1938)¶ 1.14
Schwab, Polk County (Feb. 20, 1939) 1.00
Hardin, Tex. (Oct. 12, 1938)¶ 1.02
Tepetate, La. (Oct. 11, 1938)‖ 1.03
Villa Platte, La. (Oct. 11, 1938)‖... 1.03
Abbeville, La. (Jan. 1, 1939)‖....
.....See note below
Bosco, La. (Dec. 3, 1938)‖ ..... .93
Creole, La. (Oct. 13, 1938)‖ ..... .96
Gueydan, Sweet Lake, and Louise, La. (Oct. 13, 1938)‖....See note below
Vinton, Edgerly, Starks, Hackberry, Timbalier Bay, Quarantine Bay, and Grand Bay, La. (Oct. 13, 1938)**
.....
Long Lake, Tex. (Oct. 13, 1938** 1.08
Segno and Wing (Oct. 13, 1938)**
.....See note below
Livingston (Oct. 11, 1938)† 1.10
Gibson, La. (Oct. 11, 1938)† 1.04

*Humble Oil & Refining Co. †Shell Oil Co., Inc. ‡Texas Co. §Continental Oil Co. ¶Magnolia Petroleum Co. ‖Pure Oil Co. **Gulf Refining Co.

Black Bayou, etc., starts at below 20 degrees at 79 cents; 20-20.9, 81 cents; 21-21.9, 83 cents, then a 3-cent spread to 26-26.9 degrees, 98 cents. Then a 2-cent spread to 40 degrees and over at $1.14. Abbeville starts at below 36 degrees, 92 cents, 2-cent spread to 40 degrees and over at $1.02. Gueydan, etc., starts below 20 degrees, 79 cents, 3-cent spread to 26-26.9 degrees at $1, and 2-cent spread to 40 degrees and over at $1.28. Segno and Wing take Gulf Refining Co.'s Gulf Coast prices. Vinton, Edgerly, etc., schedule starts at below 18 gravity, 76 cents, 2-cent spread to 20-20.9 at 82 cents; then a 3-cent spread to 26-26.9 at $1; then a 2-cent spread to 34 degrees and over at $1.16. Schwab posted by Shell Oil Co., Inc.

North Louisiana and Arkansas

Shreveport, La. (Mar. 25, 1939) .. $1.01
Shreveport, La. (Mar. 25, 1939) .. 1.01
Smackover, Ark. (Oct. 5, 1938)* .. $ .73
Buckner, Magnolia, and Village, Ark. (Oct. 5, 1938)*....See note below
Schuler, Jones sand.....See note below
Tullos and Urania ..... .89
Cotton Valley, La. (distillate) (Dec. 23, 1938)* 1.20
Lisbon, La. (Sept. 19, 1938)
.....See note below

*Smackover posted by Standard Oil Co. of Louisiana, October 5, 1938; by Magnolia Petroleum Co., October 12; by Gulf Refining Co., October 13; McMillan Refining Co. and Cross Refining Co. met price. Tullos and Urania posted by Hunt Oil Co. and Arkansas Fuel Oil Co.

Schuler Jones sand schedule starts at below 25 degrees, 66 cents, with 2-cent spread to 40 and over at 98 cents; by Lion Oil Refining Co. on October 5, 1938; Schuler light Morgan sand crude takes North Louisiana gravity scale along with El Dorado and Champagnolle; by Lion Oil Refining Co., October 5; Buckner, Magnolia, and Village schedules posted by Standard Oil Co. of Louisiana and Lion Oil Refining Co. on October 5; quote same prices as for Schuler Jones sand crude. Shreveport: $1 price by Caddo Crude Oil Purchasing Co.; 98-cent price by Atlas Oil Corp.

Middle Western States

OHIO OIL CO.
(Effective October 13, 1938)

Lima, Ohio ..... $ .90
Illinois old fields 1.05
Illinois basin 1.15
Princeton, Ind. 1.05
Western Kentucky (Oct. 13, 1938)† 1.10
Greendale, Porter, and Crystal, Mich. (Jan. 6, 1939)* ..... .92½
Buckeye, Bentley, Edenville, Beaverton, Mich. (Jan. 6, 1939)* ..... .90
Freeman-Redding, Mich, (Jan. 6, 1939)* ..... .82
West Branch and Arenac, Mich. (Dec. 13, 1938)* ..... .70
**Allegan-Kent (Mar. 15) ..... .68
Bloomingdale (Dec. 19) ..... .84
Muskegon 1.00
Sherman, Mich. (Dec. 13, 1938)‡ .. .82
Eastern Kentucky:
Big Sandy River† 1.12
Kentucky River† 1.20

*Simrall Corp. †Ashland Refining Co. ‡Pure Transportation Co. **Commonwealth Pipe Line Co.

Rocky Mountain States

Dry Creek, Wyo. (Oct. 11, 1938)* $ .92
Elk Basin, Wyo. (Oct. 11, 1938)*† .90

(Continued on Page 111)

New or Improved Equipment

King Service Reel Is Carried in Turtleback of Automobile

The King bottom-hole service reel, designed primarily for running bottom-hole pressure equipment, has been introduced by the Koenig Iron

Works, Houston, Tex. It is adaptable also for running paraffin-scrapers, measuring-lines, and formation fracturing.

The reel is mounted in the turtleback of an automobile, as shown in the illustration, and is operated from a King power take-off and gearbox. The drum is engaged by raising the idler pulley. Quick stopping is assured by releasing the idler and engaging the brake. The entire mechanism of this special reel is enclosed in the turtleback of any make of coupe, allowing it to be fully out of sight when the lid is closed.

Marmon-Herrington Units Defy Tough Going in Oil Fields

The problem of transportation in oil production has become more difficult as oil frontiers have been pushed back, and automotive engineers have been called upon for vehicles with power and traction equal to the demands placed upon them. Here Marmon-Herrington all-wheel-drive trucks, truck-tractors, and commercial and passenger cars are

said to have found one of their most extensive fields of usefulness. With live, pushing-pulling power on all wheels, these vehicles are doing things previously thought impossible.

With traction on the front as well as on the rear wheels, these vehicles are designed to walk right through deep mud, slush, snow, loose gravel and dirt. They go down into soft ditches, swales and ravines, and out again, instead of bogging down under their own weight. They climb grades which used to mean defeat.

"We feel pleased over the growing appreciation of our vehicles in oil production," says C. Alfred Campbell, general sales manager of Marmon-Herrington. "Our all-wheel-drive trucks and passenger cars are now in service on every continent and in practically every major oil field throughout the world, from Arabia and Egypt to South America. The extra-heavy-duty Harmon-Herrington units, with load capacities up to 25 tons are widely used in transporting heavy drilling rigs and machinery, while Marmon-Herrington all-wheel-drive Fords find their greatest usefulness in seismographic scouting, in hauling supplies and workmen."

The Marmon-Herrington Co.'s general offices and principal manufacturing plant are in Indianapolis, Ind.

New Dowell Districts Announced

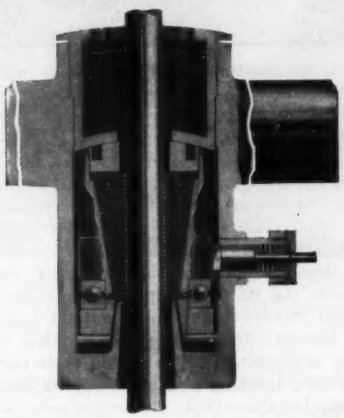
Dowell, Inc., has established two new operating districts, one in Salem, Ill., and the other in Owensboro, Ky. The treating stations at Flora and Lawrenceville, Ill., and Owensboro, Ky., will continue to serve their areas as in the past. J. H. Courtner, formerly district manager in Lawrenceville, has been transferred to Salem in the same capacity. W. W. Love, research engineer, and L. D. Brunson, sales engineer, formerly in Lawrenceville, will now be stationed in Salem. Bernard E. Langley, sales engineer in Seminole, Okla., has been transferred to Salem. The Lawrenceville station, formerly operated under the Lawrenceville office, will be operated as a part of the Owensboro district. Leo Courtner, formerly manager of the Owensboro station, has been appointed manager of the Owensboro district. R. S. Bonham will continue in charge in Lawrenceville. In addition to its regular acidizing service, the company offers many special services in connection with the chemical treatment of oil and gas wells. General offices of Dowell, Inc., a subsidiary of the Dow Chemical Co., are in the Kennedy Building, Tulsa.

Klein Sails for South America

L. C. (Lew) Klein sailed Friday, April 7, on the Grace line steamer Santa Elena for South America as foreign representative for the O. C. S. Manufacturing Co., of Coffeyville, Kans. He will make his first stop at Barranquilla, Colombia, and will cover the rest of the trip by Pan American Airways. He expects to be gone about three months.

Rod-Hanger Designed to Solve Many Production Problems

A new design of polished-rod hanger, which, according to the manufacturers, is a solution of many production problems, has been introduced by the Advanced Petroleum Equipment Corp., Houston, Tex. The polished rod is held firmly in slips, which set in a bowl mounted on ball bear-



ings. A rotating element keeps the rod turning continually while the well is pumping, which permits an even distribution of rod wear. The slip bowl is also supported on two rocker bearings which allow it to rock freely, compensating for any stress or strain resulting from the polished rod not traveling in perfectly straight lift.

The accompany illustration is a cross-sectional view of the rod-hanger, showing the ball bearings, rocker bearings, slips, rotating element, polished rod, and other points of construction.

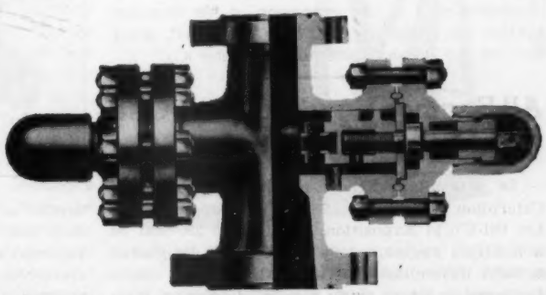
Advantages enumerated include: Rocking action reduces the bend on the polished rod, thereby eliminating much of the wear on the stuffing-box; constant rotation of sucker-rods assures uniformly distributed wear on working-barrel, and consequently longer life; any danger of the sucker-rods backing off at the couplings is eliminated; rotation eliminates any continual wear in one position on rods or in tubing. The hanger is designed to handle the maximum depths of production.

CONTROL HEAD FOR HIGH-PRESSURE CHRISTMAS TREES

Cameron Iron Works, Inc., Houston, Tex., announces the Type TCHR ram-type tubing control head or blowout preventer, designed especially for use in high-pressure christmas tree assemblies when it is desired to suspend and seal the tubing on rams, and when casing outlets are provided below. The opening through this head is 4 inches. Test pressures are 6,000 pounds, or 10,000 pounds, as desired.

No openings are provided above or below the rams. Rams are manually operated and fitted with Cameron self-feeding ram packing elements. Available with rams to close on 2-inch (2⅜ inches O.D.) or 2½-inch (2⅞ inches O.D.) tubing.

Although this head is designed for use on christmas trees, it is adaptable for other special-duty



work. Full details may be obtained from Cameron Iron Works, Inc.

Optional Fuel Systems Offered by New Caterpillar Tractor

A 25-horsepower tractor, the R2, has been announced by Caterpillar Tractor Co., Peoria, Ill. Designed to operate economically under all conditions, the tractor features an engine with optional fuel systems—high compression for burning gasoline, moderate for using various grades of tractor fuels.

The four-cylinder engine has a bore and stroke of 3¾ by 5 inches and turns at 1,525 r.p.m. It has a five-bearing crankshaft, replaceable alloy iron cylinder-liners and forced-feed lubrication to all working parts.

Modern in both mechanical design and appearance, the R2, the company says, is the most efficient 25-horsepower spark-ignition tractor it ever offered. To increase the working ability of the new tractor and to cut 20 to 40 per cent off normal working time, a five-speed transmission has been provided. This is designed to offer the correct working speed for every type of job that the machine will encounter.

The R2 is offered to handle blade graders designed for tractors of about 25 horsepower. In addition, it will pull smaller maintenance machines, terracers, roll-over scrapers and similar loads. It is especially adapted for hauling of supplies and equipment.

The new machine, with greater steering leverage, is said to have finger-tip ease of operation. The master clutch is hand-operated, and there is a roomy, comfortable, full-upholstered seat.

More Work for Captain Higgins

Capt. A. E. Higgins, vice president of the Pittsburgh Equitable Meter Co., Pittsburgh, Pa., has been placed in charge of sales for both that organization and its subsidiary, Merco Nordstrom Valve Co. Before he became associated with the Pittsburgh Equitable Meter Co., Captain Higgins was secretary of the Natural Gas Section of the American Gas Association. He has long been a prominent figure in the gas industry. Announcement of the expansion of his responsibilities was made by Col. W. F. Rockwell, president of the Pittsburgh Equitable Meter Co.

All Engines Handled From One Position With Rig Control

Of particular interest among the exhibits of Caterpillar Tractor Co., Peoria, Ill., at the Houston Oil-World Exposition, April 24 to 29, will be a multiple engine rotary rig control designated to solve difficulties experienced by drill rig manufacturers or others using paralleled engines. With the new control all engines can be handled from one position. Purely mechanical, it makes possible the installation of a series of engines in any relative position with respect to one another.

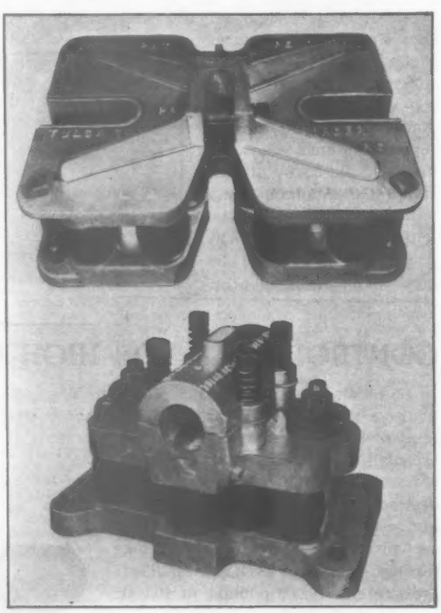
To go with its natural-gas conversion attachment for Diesel engines, Caterpillar Tractor Co. will exhibit a water-insulated exhaust manifold and special oil-field radiator. The manifold, designed to take care of the higher exhaust temperatures which result from using natural gas as fuel, is modified from the "Caterpillar" marine engine manifold now used in hundreds of installations. The unit is especially well suited for tropical installations.

Designed for efficient service with a minimum of attention, Caterpillar's 8-horsepower, air-cooled, single-cylinder engine, also is to be shown. With no water to freeze or boil away and with an unusually large lubricating oil sump, the new engine is especially suited for oil well pumping, where the horsepower requirements are low.

Rod Breakage and Stresses on Working Equipment Reduced

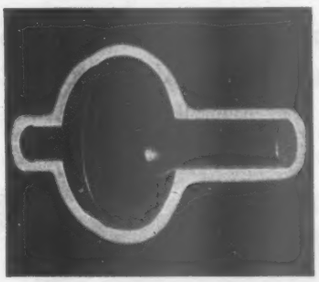
Two types of shock-absorbers of unique design for use on pumping wells and pumping units are offered by Tulsa Shock Absorber, Inc., 714 South Boston, Tulsa. They incorporate features which reduce rod breaks and relieve stress and strains on bandwheels, belts, and other working equipment. The polish-rod type, designed to fit any beam-hanger or standard beam, is equipped with 20 long-life rubber cushions of barrel-like shape. The beam pitman type has an oil-bath bronze bearing which is reversible and interchangeable and has 14 rubber cushions. It fits any standard beam.

Both shock-absorbers are said to assure smooth, easy movement in operation by eliminating jars and jumpy action. The rubber cushions show little wear over long periods of operation and do not heat. These shock-absorbers have won favorable comment from operators according to J. F. Egan and J. Shan Martin, owners and distributors. In some cases, they say, operators reported as high as 75 per cent savings in rod jobs, using old rods. A recent checkup in the Seminole district, Oklahoma, showed wells that had 5 to 10 breaks a month with the same rods, now have only one break in three months. One operator reported 10 rod breaks in October and five breaks from November 1 to November 16, but after installing Tulsa shock-absorbers on November 17 had no breaks in the four months covered by his report.

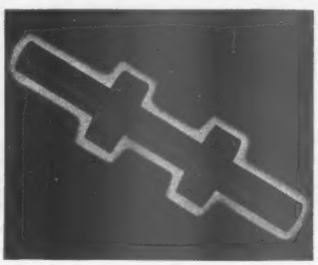


Upset Forgings Offer Needed Strength for Oil Equipment

An interesting development in oil-field drilling and pumping equipment is the use of upset forgings for vital parts subjected to severe stress and wear. The punishment which this type of equipment must undergo has made manufacturers alert for materials with something extra in the way of durability and ruggedness.



Upset forgings are said to have toughness and reserve strength, without cumbersome bulk, that make them stand up under fatigue, shock loads, and overloads. The grain flow in upset parts can be controlled in forging so that it is densest and strongest where the wear and strain are greatest. By the proper design of dies it is possible to produce a radially upset grain structure which offers maximum density and resistance to wear. On certain oil machinery parts it is necessary to use thin sections. Here the upset forging grain control provides the necessary strength.



Among advantages possessed by upset forgings it is pointed out that they can be made to conform closely to the size and shape of the finished part, effecting a minimum of wasted steel. This minimum use of steel keeps down freight costs. The cost of machining is materially reduced.

Among the oil-field machinery parts being produced by the AmForge upset process are wristpins, sleeves, various types of single gears and gear clusters, pump valve parts, couplings, adapters and crankpins. Two typical forgings are shown in the illustrations. Not all parts lend themselves to the upset method. The American Forge Division (of the American Brake Shoe & Foundry Co.), 2621 South Hoyne Avenue, Chicago, suggests that persons interested ask for recommendations by sending blueprints, sketches or sample parts, stating in what quantities the parts are used, or that they write for a special bulletin just prepared on upset forged parts for oil-field equipment.

New Sievers Reamer Catalog

Of particular interest to oil men is a 16-page catalog devoted to information on the Sievers reamer, a product of the Security Engineering Co., Inc., Whittier, Calif. Illustrations show how the shearing action of the reamer insures permanent reaming efficiency. The wide wall contact and unusually effective stabilizing properties are also explained photographically. Tables on sizes and types of reamer-cutters and bodies available for all reaming and stabilizing operations are included, together with cutter assembly parts.

Wide Range of Conditions Met by Acme Gas Lift's Product

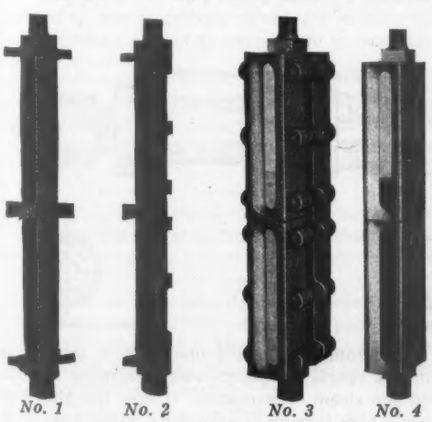
The maximum range of producing conditions can be met with the Acme gas lift, introduced by

the Acme Gas Lift Co., Houston, Tex., as the equipment is available in sizes from 2½ inches external upset to 1 inch regular, using either an "open" system or a "closed" system. With the "closed" system it is possible to produce a well without exerting an input back-pressure on the producing formation.

The device, introduced by Acme early in 1937, is said to have met immediate approval, and it is now being widely used by both majors and independents. Low maintenance cost and long, satisfactory service are assured, according to the manufacturers.

Tailor-Made Gauge, Reflex or Transparent, Built on Order

A new gauge for separators, gasoline plants, and refineries, with a one-piece fluid channel any length up to 10 feet is announced by the Inferno Co., Shreveport, La. This "tailor-made" gauge can



No. 1 *No. 2* *No. 3* *No. 4*

be either reflex or transparent, and is manufactured only on order and to specifications as to over-all length and the threads desired on the ends. Quick-operating clamps, used to hold the glasses in place, are designed so that a glass cannot be accidentally broken by applying too much pressure on any one screw during installation.

The one-piece core is made of navy bronze, steel, or stainless steel, depending on pressures, temperatures and corrosive conditions. The core is bored from a solid bar of metal, and apertures then are cut through into this channel over which gaskets, glasses, and clamps fit snugly. Only 1 inch intervenes between visible sections.

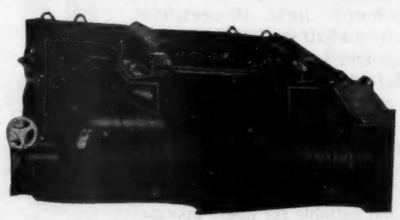
The gauge conforms with A.S.M.E., A.P.I. and all other known requirements for equipment of this nature. Bulletin No. 20 is available.

In illustration, No. 1 is a core for a transparent-type gauge, with channel bored straight through the bar of metal and with lugs welded between the apertures to guide the glasses and clamps into correct position. In this case the customer ordered a male thread on one end and a female thread on the other. No. 2 is a core ready for reflex-type gauge, with apertures cut through into the channel on one side only; 3, transparent-type gauge assembled; 4, reflex-type gauge assembled.

Grizzly Turnback Saves Wire Line Against Excessive Wear

The Grizzly wire-line turnback, manufactured by the E. M. Smith Co., Los Angeles, Calif., consists of a tough rubber roller operating in a metal housing which can be either welded or bolted to the drawworks guard at a 90-degree angle to the direction of line travel, so that the wire line rests lightly against the rubber roller as shown in the illustration. A simple adjustment feature permits proper tension to meet specific conditions.

It is specially designed to turn back the wire line as it reaches each end of the drum, with just enough pressure to make it start back smoothly and evenly, preventing it from piling up, crawling or overlapping. It prevents the line from dragging against the sharp edge of the guard of the draw-



works, sand-reel, etc., thus eliminating much of the wear and breakage of cable strands. It also protects the line from injury due to terrific blows against drum flanges, as frequently occurs when the whip is not eliminated.

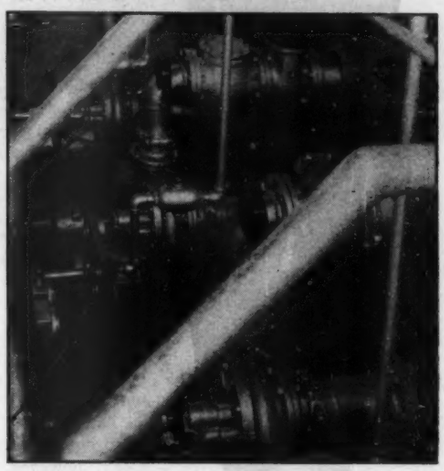
The steel core of the tough rubber roller is packed with a high-quality grease to eliminate necessity for lubrication. The ball bearings at each end permit the roller to spin freely, easily and smoothly at the slightest contact with the wire line.

Pocket Kit for Snakebite

A new pocket snakebite kit of value to many oil-field workers, enabling a man to treat himself after being bitten by rattler, copperhead, or moccasin, has been developed by the Davis Emergency Equipment Co., 55 Van Dam Street, New York. This kit, which can be carried in a vest pocket, contains a tourniquet to prevent spread of the poison; a stainless-steel lancet for opening up the fang holes to permit drainage of the poison; a syringe, for pumping blood and venom from the wound; antiseptics, bandages, and ammonia inhalants for use if victim becomes faint. Records show that if the treatment indicated is applied promptly by the victim himself or a companion and is later followed by medical treatment, recovery is the rule.

Striking Record Made by Ford V-8's in Belridge Oil Field

These three Ford V-8 engines (and a fourth, not shown) have operated the equivalent of over 100,000 road miles each in the positions in which they are pictured. They are attached to pumps which circulate water through gas compressors in the plant of the Cowan Oil Co. in the Belridge oil



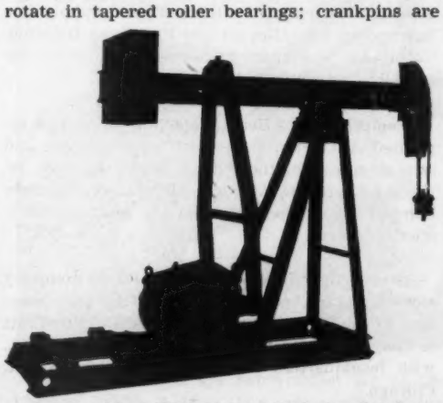
field about 50 miles northwest of Bakersfield, Calif. The four engines use natural gas for fuel and run 24 hours a day.

Pumping Unit for Shallow-Well Use Developed by Oil Well

The new "Oilwell" TC-5 pumping unit has been developed by Oil Well Supply Co. to fill the need for a shallow-well unit of dependable and efficient performance. It is a portable, self-contained, twin-crank unit of 5,000-pound polished-rod capacity. Stroke lengths are 16, 18, 20½ and 24 inches. Peak torque capacity at 20 s.p.m. is 22,500 inch pounds.

Of particular interest is the structural-steel frame, consisting of a rigid, widespread base and a high samson-post of the four-leg, derrick type, a construction usually found only in pumping units designed for heavy-duty service. The base is of rectangular shape, without overhang at the sides. Universal slide rails facilitate mounting various types of prime movers on the base. An arc-type hanger assures straight polished-rod lift.

The speed-reducer is equipped with single-helical, double-reduction gears providing a ratio of 32 : 1, which facilitates the use of low-priced, high-speed prime movers. All speed-reducer shafts rotate in tapered roller bearings; crankpins are



equipped with self-aligning, spherical roller bearings; and the upper pitman and saddle bearings are bronze-bushed. Oil seals retain lubricant in all bearings. The TC-5 pumping unit is described in bulletin No. 180.

Swabbing and Bailing Block Is Put on Market by McKissick

During the past two or three months a great deal of interest has been developed in the new swabbing and bailing block perfected by McKissick Products Corp., Tulsa. This is a utility block designed for extremely high speed and durability. It is provided with sealed automatic lubrication and comes equipped with a ball-bearing swivel assembly, which permits it to swing freely under load.

The principal feature of the block, however, is the fact that instead of a single center bearing there are two bearings set on each side of the sheave. The block may be used also as a traveling block or floor block for handling tubing or rods in shallow fields.

Here and There With Men Who Manufacture Equipment

Jack Stovall, for years with Globe Oil Tools Co., has transferred his headquarters to the Hake Tool Co. offices, 1121 Rothwell Street, Houston, Tex., where he will serve as special field representative for that company in order to cooperate more closely with Hake in the sale and distribution of Globe drilling, reaming, and coring tools.

Alfred E. Ballin, formerly vice president and general manager of the International Supply Co., has opened an office in the Philtower Building, Tulsa, for engineering counsel, industrial appraisals, and commercial investigations.

Foote Brothers Gear & Machine Corp. has appointed A. C. Hanson district representative and sales engineer for the Detroit, Mich., territory, replacing Everett G. Akridge. Mr. Hanson formerly handled the northern Indiana and southern Michigan territory.

George J. Helfrich, associated with the company since 1925, has been appointed district sales manager of the Chicago territory by the Reading-Pratt & Cady Division of American Chain & Cable Co., with headquarters at 400 West Madison Street, Chicago.

R. L. (Bob) Easley of the Houston, Tex., branch of Petroleum Rectifying Co. of California, left recently via Pan American Airways for Venezuela on the first leg of a tour of inspection of Petreco Electromatic dehydration plants in the oil-producing countries of South America. He also will supervise installation of new plants shipped from Los Angeles during the past few months.

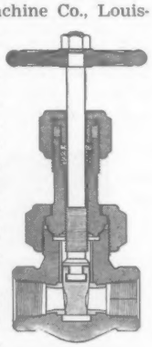
Regan Forge & Engineering Co., of San Pedro, Calif., has appointed Charles S. Stewart to represent it in the San Joaquin Valley district. His headquarters will be at 525 F Street, Taft, Calif.

The wrench division of the Bemis & Call Co. has been acquired by the Billings & Spencer Co., and all the former company's wrench products, including the Coes line, will be produced and shipped from the Billings & Spencer plant in Hartford, Conn.

Owing to his health, E. B. Beard, Walter O'Bannon Co. representative in El Dorado, Ark., has found it necessary to take an extended vacation, and his territory is being handled by W. J. Hennigan, former O'Bannon representative in Kansas. A new O'Bannon representative for West Texas and New Mexico is H. H. Richards, whose headquarters are in Midland, Tex. Recently transferred from Kilgore, Tex., is R. L. Hodshire, whose headquarters are in Stillwater, Okla.

The address of the Shreveport, La., office of Allis-Chalmers Manufacturing Co. has been changed from 712 Ardis Building to 611 City Bank Building. L. G. Park remains as representative in charge.

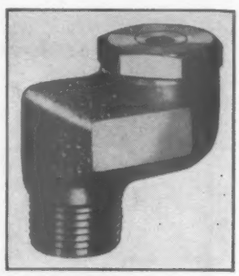
Safe, Trustworthy Regulation Is Afforded in New Vogt Valve



The drop-forged steel gate meter valves announced by the Henry Vogt Machine Co., Louisville, Ky., are of the union-bonnet, ground-joint, and inside screw stem type with removable rolled-in seats and a loose, slotted gate. They are made in one-fourth inch, three-eighths inch, one-half inch, three-fourths inch and 1-inch sizes of carbon steel with stainless-steel trim or of all stainless steel, as required by the particular operating conditions.

Valves of this type, according to the manufacturer, will be found suitable for many applications where safe and dependable regulation is required for meter and gauge lines at high pressures and high temperatures.

Hollow-Cone Spray Is Produced by Nozzle of Whirljet Type



The Whirljet angle type, nonclogging spray nozzle placed on the market by Spraying Systems Co., 4922 West Grand Avenue, Chicago, produces a hollow-cone spray with uniform distribution. These nozzles are sturdily constructed and have large passages, designed to make them practically clog-proof. Pipe connection is three-eighths inch male. The nozzles are available in six different capacities from .5 to 2.5 g.p.m. at 10 pounds pressure. Standard stock construction is brass. Other metals can be specified.

The nozzles are designed for air-conditioning, air-washers, air-coolers, brine-spraying, chemical processes, or wherever it is necessary to have a nonclogging, centrifugal-type nozzle, with the pipe connection parallel to the direction of the spray.

New Cosco Marketing Policy

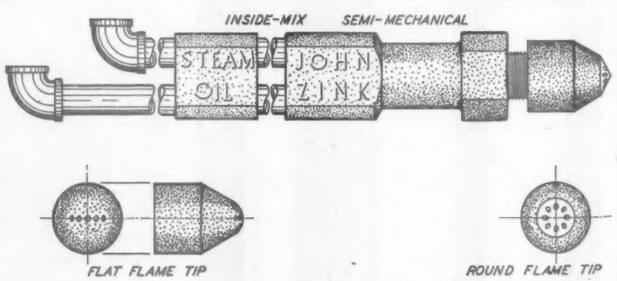
Cosco Manufacturing Co., Los Angeles, Calif., manufacturer of casing-centralizers, liner-pullers, liners, pump valves, and pistons, has adopted a new marketing policy in the Mid-Continent and Gulf Coast areas, selling directly through all supply stores with its own representative, Walter A. Scott, in charge of sales. Mr. Scott was for many years sales representative for Star Drilling Machine Co., and Lee C. Moore & Co. Mid-Continent headquarters are at 801 Commerce Street, Fort Worth, Tex., where a complete stock is maintained.

New Gasket Material Announced

A new gasket substance, designated as Formula No. 8, is in production by the Lithox Corp., Wapakoneta, Ohio. It is said to resist both lengthwise and crosswise spread, curling and bulging after three to four weeks submergence in gasoline or oil. Formula No. 8 was developed incidentally to a search for a new sole and soling material capable of withstanding the effects of gasoline and oil. This substance is available in sheets 31¼ inches square and one-eighth, one-fourth and five-sixteenths inches thick.

MAKES FLAME BEST SUITED FOR ANY GIVEN FURNACE

The John Zink semimechanical oil burner, announced by John Zink Co., Tulsa and New York, was developed to meet the demand for a burner with low steam consumption and capable of producing the type of flame best suited for any given furnace. It may be installed anywhere steam and oil are available.



The burner is a steam atomizing type. The atomizing chamber is so designed that there is no loss in pressure in either the steam or oil until both are delivered to the oil tip. Semimechanical atomization is obtained due to this extra pressure on the oil at the burner tip. This extra pressure greatly reduces the steam required for atomization. Complete atomization is effected on all grades of oil.

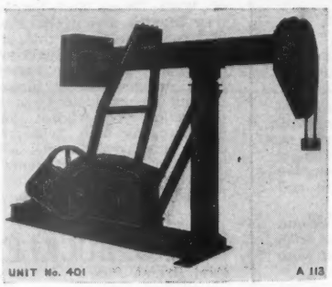
Oil burner tips are made from cast iron, chrome steel, or a special heat- and corrosion-resisting metal. The burner is so designed that it will pass through standard 2-inch pipe and such pipe can be used as a guide or support to hold it in wall thimbles or other types of burner openings.

According to the manufacturer, it is easy to install, simple to operate, and economical in both oil and steam consumption. It does not plug and has a high turn-up or turn-down ratio; that is, it operates over a wide range of ratings and the tip can be drilled so as to produce a long, narrow or a short busy flame.

Atlas Supply Introducing Units for Pumping Shallow Wells

Atlas Supply Co., Muskogee, Okla., announces two new sizes of pumping units designed for wells from 300 feet to 3,000 feet deep, depending on the quantity of fluid to be handled. Both units are of the self-contained, twin-crank, double-reduction type and are rated at 3.7 and 5.8 horsepower respectively, with corresponding peak torque ratings of 18,000 and 28,660 inch-pounds. Strokes range from 18 to 24 inches on the smaller unit, and from 24 to 33 inches on the larger, with the variation obtained by changing the position of the tailboard bearing.

The reduction unit consists of two roller chain drives of Diamond alloy roller chains with extra-heavy side bars, operating on machined sprockets,



the two smaller of which are made of hardened steel and the larger ones of cast iron. Chain adjustment is made quickly and accurately by shifting the position of the carrier for the intermediate shaft. The chain operates in a bath of oil, protected by seals at all shaft openings.

A construction feature of unusual interest is the manner in which the speed-reducer case is made from heavy channel sections, and shielded arc-welded at the four corners of the case. This produces a heavy box member with greater strength and less strain than would be possible with sheet construction. The case is in turn welded to the main base of the unit, making a rigid structural frame. Antifriction bearings are used throughout.

Bulletins, Booklets, and Other Literature for the Trade

Catalog 165, issued by Precision Scientific Co., 1750 North Springfield Avenue, Chicago, is a spiral-bound booklet of 112 pages devoted to precision apparatus for testing petroleum products.

C. J. Tagliabue Manufacturing Co., Park and Nostrand Avenues, Brooklyn, N. Y., has issued Catalog 1170, devoted to Tag dial-indicating thermometers.

The Eclipse Air Brush Co., Inc., Pneumix Division, Newark, N. J., has issued a six-page illustrated data folder on the performance of its Pneumix air-motored agitators in laboratories and industrial plants.

A bulletin available from W. F. & John Barnes Co., Rockford, Ill., gives information about Barnes hydraulic actuators for valves, dampers and gates.

Besides its usual offering of interesting reading, the current issue of the Lufkin Line, published by the Lufkin Foundry & Machine Co., Lufkin, Tex., contains an attractive spread showing modern Lufkin installations of pumping units.

A bulletin devoted to new lead-bearing open-hearth steels, which are said to improve machinability 20 to 40 per cent and increase tool life without sacrificing the desirable qualities of open-hearth steels, may be obtained from Joseph T. Ryerson & Son, Inc., Sixteenth and Rockwell streets, Chicago.

Landis Machine Co., Waynesboro, Pa., has prepared a bulletin describing its line of hardened and ground die-heads.

Larkin Packer Co., St. Louis, Mo., is sending on request a 20-page bulletin on Larkin rotary hole equipment.

Griscom-Russell Bentube sections are described and illustrated in a 24-page booklet obtainable from Griscom-Russell Co., 285 Madison Avenue, New York.

Johnson Bronze Co., 300 Mill Street, New Castle, Pa., is mailing on request a 72-page booklet discussing its sleeve bearing service, along with a price list on bearing bronze.

A bulletin devoted to the Wheelco industrial indicating control thermometer is available from Wheelco Instruments Co., 1929 South Halsted Street, Chicago.

"Molybdenum Steels in Oil Production" is an attractive booklet of 32 pages offered by Climax Molybdenum Co., 500 Fifth Avenue, New York. The publication discusses the value of these steels in drilling and pumping operations.

Application of Metermax combustion control to boiler furnaces of every major type—pulverized coal-fired, stoker-fired, gas and oil-fired—is featured in a 32-page catalog, N-01-163, just issued by the Leeds Northrup Co., 4934 Stenton Avenue, Philadelphia, Pa. This publication not only pictures each type of installation, but by means of schematic diagrams shows how Metermax is applied.

The Hobart Brothers Co., Troy, Ohio, offers a bulletin in two colors giving specifications on gas-driven arc welders. It presents information on mechanical make-up as well as special features of this type of equipment.

In a 32-page booklet Ingersoll-Rand Co., 11 Broadway, New York, presents detailed information about its new line of two-stage air-cooled portable compressors.

The mechanical features of "Caterpillar" Diesel tractors, engines and road machinery, are discussed in a booklet just issued by Caterpillar Tractor Co., Peoria, Ill.

Allis-Chalmers Manufacturing Co., Milwaukee, Wis., has issued a four-page leaflet 2199-C covering single-suction, single-stage, close-coupled utility pumps for every industry, handling from 10 to 1,600 g.p.m. and using motors up to 75-hp.

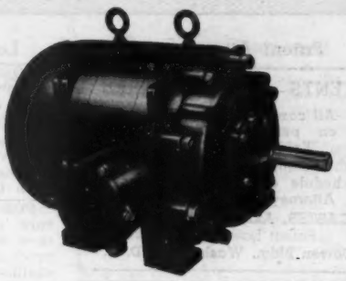
A bulletin on its line of vacuum pressure tank equipment may be obtained from Enardo Foundry & Manufacturing Co., 2729 Sand Springs Road, Tulsa.

Sucker Rods From Mine to Well

"Sucker Rods From Mine to Well," a talking picture produced under the supervision of Oil Well Supply Co., will be included as part of the moving picture program at the forthcoming Oil-World Exposition in Houston. Of special interest is the use of animated diagrams and transparent samples illuminated by polarized light to emphasize the causes of sucker-rod failure. The picture shows too the various processes in the manufacture of sucker-rods and the methods of laboratory testing. Included are recommended field practices for the care and handling of rods.

Howell Makes Additions to Line of Explosion-Proof Motors

Howell Electric Motors Co., Department Y, Howell, Mich., announces an extension to its line of Types EKBB (polyphase) and EKCI (single-

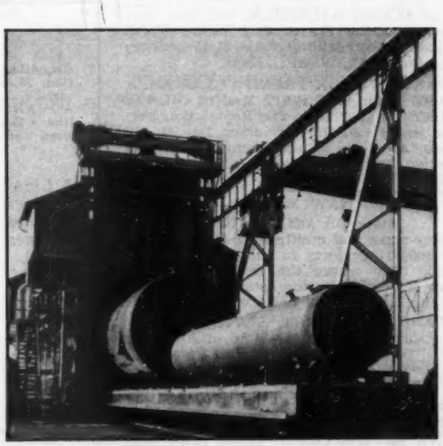


phase) explosion-proof motors up to 40 horsepower. These motors are specially built for operation where inflammable gasoline vapors or other highly volatile petroleum products are manufactured, handled or stored, such as in refineries, terminals, bulk plants and in service stations. They are totally enclosed.

Tests are said to have shown that this special Howell design will withstand the explosion of an inflammable substance inside the motor and prevent the flames produced by such an explosion from reaching the surrounding atmosphere; also that the Howell heat capacity is great enough to prevent the motors, even under abnormal conditions, from reaching a temperature high enough to ignite surrounding gases.

Celebrates Eightieth Anniversary

Hewitt Rubber Corp., Buffalo, N. Y., manufacturer of hose, conveyor, bucket-elevator and transmission belting, and packings, is celebrating this year the eightieth anniversary of the Gutta Percha & Rubber Manufacturing Co., which was taken over by Hewitt in 1926. In the United States alone 200 distributors sell Hewitt products. Assisting them are 33 factory representatives at strategic points. The Hewitt research laboratory, under the direction of Michael Berman, is credited with contributing greatly to the rubber manufacturing industry. The Hewitt plant consists of seven buildings containing 205,000 square feet of manufacturing floor space. Approximately 500 men and women are employed regularly. Thomas Robins, Jr., is president.



The two vessels are being taken out of the Chicago Bridge & Iron Co.'s stress-relieving furnace at Birmingham, Ala. The one in the foreground is a fractionating tower for the Atlantic Refining Co. The salt storage tank, 12 feet in diameter and 30 feet long, partly in the furnace, is for a Houdry process unit at Chaison, Tex.

CLASSIFIED ADVERTISING

Patent Attorneys

PATENTS — TRADE MARKS

All cases submitted given personal attention.
Form **"Evidence of Conception"** with instructions for use and **"Schedule of Government and Attorneys' Fees—FREE**
LANCASTER, ALLWINE & ROMMEL
Patent Law Offices
418 Bowen Bldg., Washington, D. C.

JACK A. SCHLEY
PATENT LAWYER
Patents obtained — infringement practice in all Courts—oil field experience. 1807-11 Tower Petroleum Bldg., Dallas. 2014 Second Nat'l. Bank Bldg., Houston. 707 Insurance Building, San Antonio. 433 Munsey Building, Washington, D. C. Address any of these offices.

Leases and Drilling Blocks

LEASES—East Texas, La., South Ark. 20 acres up, dollar acre up.—Owners—Address Attorney, Box 1122, Little Rock, Ark.

BUY leases, Royalties, extreme east Texas and Louisiana, present opportunity excellent. Box 42, Shreveport, Louisiana.

320 ACRES, Crane Co., Tex., Magnolia lease, cheap in fee. Address 415 Littlefield Building, Austin, Texas.

5 ACRE Mineral Deed, Landowners Royalty under entire 80 acres of land leased to Gulf Oil Co. being N½ NW¼ Sec. 30, Twp. 14s, Rge. 31e, full price only $32.50. Perpetual and full participating. Send your check. Guarantee delivery. P. O. Box 968, Hobbs, New Mexico.

MISSOURI Leases in blocks and scattered acreage. Harrah and Firth, Chillicothe, Missouri.

ILLINOIS 60,000 acres in and near production. Illinois Minerals Company, Cairo, Illinois.

CHEAP ACREAGE
30,000 acres in Spencer and Perry Counties, Indiana. R. E. COPE, Rockport, Ind. Phone 175.

FOR Leases, Royalties, or Land in North Missouri (Forest City Basin) write N. W. Phillips, Milan, Mo.

MISSISSIPPI ROYALTIES, leases and drilling blocks. Submit your requirements for prompt attention. J. P. Fraim, Edwards Hotel, Jackson, Mississippi.

DEALERS, SALESMEN, sell hot spot leases in the Forest City basin, North Missouri near drilling wells. $1.25 per acre up. Box 2231, Wichita, Kans.

SPARTA-WILCOX TREND TEXAS AREA 10,865 Acres HOT SPOT MAJOR OIL CO. PLAY. 20 year term 25c Rental Commercial leases 4,265 Royalty acres. Dewitt, Lavaca, Atascosa, Wilson counties. Get protection now. Exploration, Inc., Petroleum Bldg., Fort Worth, Tex.

NEW MEXICO
State Oil and Gas Leases
Forty acres and multiples thereof at $6.00 to $60.00 per forty in the Hot Spots. No junk! Buy where the major companies own leases. Write for lists. Twenty years in the business and not a complaint.
HARRY S. WRIGHT, STATE LESSEE
Registered Dealer—State of Iowa
Box 166, Council Bluffs, Iowa
Box 347, Santa Fe, New Mexico.

WILL SELL Quarter interest in lease, shallow oil district for $150 to finance well. Box 262, Claremore, Oklahoma.

NW Edwards County, Texas, 12,000-acre block adjoining shallow production. Near gas-distillate field. Want drilling deal to 6700 feet. Box 876, McCamey, Texas.

SACRIFICE 40-acre Oil Lease, Chaves County, for only $10.00, full price. Guarantee title. P. O. Box 191, Clovis, N. Mex.

OIL AND GAS LEASES
Forest City basin in Missouri. Seme on Geophysical highs and known structure, close to wells. Box 152, Milan, Mo.

Leases and Drilling Blocks

FOREST City Basin, Kans. & Mo. Leases, 40 acre tracts and drilling blocks. Margaret Haynes, R. #3, N. Topeka, Kansas.

HAVE leases near Gulf, Sun, Continental, Humble, Magnolia leases in geological approved area West Texas. Will sell spread or single leases. Exploration, Inc., Petroleum Bldg., Fort Worth, Tex.

FOR SALE Oil and gas leases on structure, leases joining production, ten-year term wildcat leases with low rentals, and producing leases all located in Kentucky shallow oil field. W. P. HARLEY, Bowling Green, Ky.

DRILLING CONTRACTORS WANTED
Have 30,000 acres in six choice blocks in Vernon County, Mo. Between 200 and 300 shallow wells have been drilled in this county, new ones being completed every few days. Deep wells started but uncompleted, lack of finances. Deep tests showed good possibilities. One had good showing of green, paraffin-base oil, but abd. due to lost tools. Earl S. Welpton, Nevada, Mo.

15000 ACRES Perry County, Ind. 15000 acres Spencer County, Ind. 5000 acres Webster County, Ky. 6000 acres drilling block Christian and Todd counties, Ky. 10 year leases 25c rentals, acreage selected by experts. F. F. Hamilton, 909 Tulsa Loan Bldg., Tulsa, Okla.

HAVE 13,000 acres leased in Grant County, Ind., a proven Gas Territory. Will give 1000 acres for immediate drilling operations. This field has never had any drilling over 1000 feet. Write Louis P. DeZelar, 507 Archer, Peoria, Ill.

Incorporations

DELAWARE CHARTERS: Complete service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.

CHARTERS — Delaware best, quickest, cheapest, more liberal. Free forms. Colonial Charter Co., Wilmington, Del.

Contractors

FOREST City Basin—Complete cable tool contractors, deep wildcat holes, shallow information holes, clean-out service, turnkey prices. Office close to area, drillers familiar with formations. Good references. J. D. Judd & Son, Martin City, Mo. Phone Dwight 3273.

Legal Blanks

SINCE 1908 Burkhart's legal forms—serving Mid-Cont. oil fields, including Ill., La., Mo., Ind. & Ky. Free catalog & samples. Burkhart Ptg. & Sta. Co., 115 So. Cinn., Tulsa, Okla.

Help Wanted

WANTED—Experienced refinery designing draftsman. Give experience. Address Box J-947, The Oil and Gas Journal, Tulsa, Oklahoma.

SALES REPRESENTATIVE WANTED to sell well known line of wear resisting crane wheels, standard sprockets, chains, elevator buckets, and similar parts for replace. Commission basis only. In reply advise lines you are now handling, district covered and previous business experience. Address Box J-952, The Oil and Gas Journal, Tulsa, Okla.

Situations Wanted

DESIRE work Royalty Gauger with Owner Oil Producing Royalty. Reas. salary; 19 yrs.' exp. Address Box J-950, The Oil and Gas Journal, Tulsa, Okla.

COMPTROLLER tax consultant. Age 37 C.P.A. 14 yrs. experience, which includes systematizing, financial reports, and diversified public accounting. Highest credentials as to integrity and creative ability. Address Box J-951, The Oil and Gas Journal, Tulsa, Okla.

20 YRS. sales exp. mostly in parts and automotive equip. desires connection with Oil & Gas field equip. manufacturer who can use a hard hitting progressive salesman for Ohio or adjoining states. Am not an experienced oil field equip. man but will have assistance in starting by man who knows the business thoroughly. Am 49, married, neat appearance, clean record and have faith in my ability. Understand parts and mch. and am not afraid to get my hands dirty. Address H. L. Rawlinson, 139-W 1st. Ave., Columbus, Ohio.

Oil Opportunities

UNUSUAL OPPORTUNITY
Have casing, tools, derrick. Need payroll money to drill offset well in big production area. Will make excellent deal. Exploration, Inc., Pet. Bldg., Ft. Worth, Tex.

THREE wells, one barrel each per day, full equipment for another well, 750 ft. Bartlesville sand 30 feet. Thirty gravity western Labette County Kansas, tanks, pumphouse, engine, all $3,000.00. S. A. Rumbel, 210 N. Central, Parsons, Kans.

Survey Service

OIL FINDING DOWSING METHOD
My deductions a practical method which picks up vibratory reactions emanating from carbo-hydrates. Physico method finds oil, locates faults. Same method discovered great East Texas field also our Watson #2 first producer Wilmington, Calif. field. Employ a man that owns producing wells I find oil if it exists or no charge. George Miller, 1548 Post, Torrance, California.

Royalties

ANDREW J. BARRETT
The Philtower
Tulsa, Oklahoma.

Brokers—Salesmen

Sell in the most active area in the United States—The Permian Basin of West Texas and Southeastern New Mexico. From the standpoint of royalty investors this area has much to offer. Can supply you with choice non-producing royalties located on geophysical highs. Also drilling blocks, close in acreage to production, or wildcat leases. I maintain my own field men who cover this area for me. All offerings meet the requirements of the Security and Exchange Commission. Inquiries invited.

B. D. BUCKLEY
Paul Brown Bldg., St. Louis, Mo.

Producing and Non-Producing
OIL ROYALTIES
Registered Dealers Only.
GRIMES ROYALTY CO.
Hunt Bldg. Tulsa, Okla.

PRODUCING OIL ROYALTIES
15 years of experience.
L. H. WITWER
703 Kennedy Bldg., Tulsa, Okla.

WILL BUY non-producing landowners royalty—under drilling wells only. P. H. HAWLEY, 727 W. 7th St., Los Angeles, Calif.

OWNERS of fractional landowners royalty interests still paying send full details to City Investing Co., 434 Roosevelt Bldg., Los Angeles, Calif.

WANTED producing oil royalties and oil payments in North and West Texas and New Mexico. P. O. Box 1535, Fort Worth, Texas.

Oil Industry Printing

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

Financing

CAPITAL SEEKERS—Put your project before 260 Key-Men. Cost trifling. Details free. AMSTER LEONARD, Fox Theater Building, Detroit, Michigan.

AMERICA'S 72 leading underwriters $3.00. "New Type Banking Aid" FREE with order. JOHN MORRIS, 1040 South Paxon, Philadelphia, Pa.

Geophysical Service

DETAILED information available regarding present deeper drilling in Northwestern Ohio and proposal for deep test well in Lima field. Excellent chance to find new production near refineries and transportation. Jules Barnd, Faurot Building, Lima, Ohio.

For Sale—Maps

1939 EDITION MAP OF TEXAS
and Eastern New Mexico shows all OIL and GAS FIELDS up to date
$1.00 per copy
WILDCAT MAP published monthly on same area $3.00 per copy $30.00 one year.
ZINGERY OIL MAP COMPANY
Fair Bldg. Fort Worth, Tex.

MAP BOOK of all Texas counties 254 maps, each 14x16 inches. Show: Sections, blocks, surveys, certificate and abstract numbers. With Binder. Postpaid $10.00.
OIL CITY MAP CO.
Box 925, Longview, Texas.

MISSISSIPPI—ALABAMA MAPS
Ownership, base maps of all active areas. R. B. ROBINSON MAPS, JACKSON, MISS.

CLASSIFIED ADVERTISING RATES

Classified advertising rates: First insertion, 35 cents a line; each additional insertion, 25 cents a line, PAYABLE IN ADVANCE. Six words usually make a line. Count as a word each one-letter word and each group of figures. White-space computed at regular line rate. Allow two extra lines for blind ads. Ads of less than three lines not accepted. No formal acknowledgement is made, and proofs cannot be shown in advance of publication.

	1 time	2 times	3 times	4 times		1 time	2 times	3 times	4 times
3 Lines	$1.05	$1.80	$2.25	$3.30	7 Lines	$2.45	$4.20	$5.95	$7.70
4 Lines	1.40	2.40	3.40	4.40	8 Lines	2.80	4.80	6.80	8.80
5 Lines	1.75	3.00	4.25	5.50	9 Lines	3.15	5.40	7.65	9.90
6 Lines	2.10	3.60	5.10	6.60	10 Lines	3.50	6.00	8.50	11.00

CLASSIFIED DISPLAY RATES

Classified Display is set with a border and may be used in one or two column sizes

1 Inch	1 time	$5.00
1 Inch	13 times	4.50 per inch
1 Inch	26 times	4.00 per inch
1 Inch	52 times	3.50 per inch

This space may be contracted for over a period of one year from the date of the first insertion and is PAYABLE IN ADVANCE, MONTHLY.

We reserve the right to withhold all advertising of questionable character. To avoid delay be sure to send remittance with copy. We will set your ad in the smallest amount of space possible and refund all overpayments. One-time insertions will not be run until fully paid. Forms close MONDAY NOON before each issue date.

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

CLASSIFIED ADVERTISING

For Sale—Equipment For Sale—Equipment For Sale—Equipment

COMPLETE KELLOGG CRACKING UNIT

3000 bbl. capacity Kellogg Cracking Unit — Two Furnaces — Pacific Centrifugal Charging Pumps all complete, will sell "As is—where is" or take turnkey contract for dismantling and reerection. *Send Us Your Inquiries.*

3 — 260 h.p. Heine Water Tube Boilers, Inspected and Approved 160-pound Pressure. *Priced for Immediate Sale.*

SONKEN-GALAMBA SUPPLY COMPANY

W. C. Berry or H. J. Galamba,
Riverview at Second, Kansas City, Kansas

Robt. W. Duden,
2100 S. Union, Tulsa, Oklahoma

25 K.W. and 40 K.W. Gas Engines, 220 volts, D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x6 Ingersoll-Rand ER-1 Air compressor. Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.
Terms to suit.
CINCINNATI MACHINERY & SUPPLY CO.
26 West 2nd St. Cincinnati, Ohio.

FOR SALE: At Oklahoma City No. 4A National Tank Oil and Gas Separators 500# working pressure. I. T. I. O. Co., Bartlesville, Oklahoma.

TRACTORS
Government crawler type Caterpillars, 5 ton $375, 10 ton $695, Slightly used. Perfect condition.
O. C. EVANS
Mt. Sterling, Ky.

FOR SALE
1—6' x 52' Jenkins Bubble Tower.
1—5' x 30' Jenkins Reflux Tower.
1—10' x 14' Jenkins Clay Tower.
1—1000 bbl. Power Specialty Co. Pipe Still.
Miscellaneous Tanks and Equipment.
Western Tank & Road Supply Co.,
Wichita, Kansas.

FOR SALE — Keystone Spudder. Two casing pulling machines and cable tools. Box 188, Okmulgee, Oklahoma.

STANDARD and 250 SWP cast iron flanged ells and tees. I. T. I. O. Co., Bartlesville, Oklahoma.

A DOUBLE-HEADER

Our next week's issue, April 20th, will be a double-header, for it will be devoted to

THE OIL-WORLD EXPOSITION
AND
THE GULF COAST AREA

Don't fail to place your ad in this issue . . . it will be on display constantly at the exposition.

The deadline for receiving ads for this outstanding issue is April 17th, so rush your ad to us without delay.

Classified Department

FOR SALE: Steam Rotary Rig with 2500 ft. 4-inch drill pipe; 100 hp. high pressure boiler, completely equipped, in condition for immediate use. Located in West Tennessee. Priced right for immediate sale. Further information Wm. J. Meyer, 1019 Falls Bldg., Memphis, Tenn.

FOR SALE or lease. Sanderson Cyclone Class E 1500 ft. drilling rig. Address Box J-953, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE: Used large capacity positive and orifice gas meters. Geo. R. Milner, Okmulgee, Oklahoma.

FOR SALE: At Oklahoma City 1—Toledo Standard Electric Power Drive Powered with 1½ hp. 110 or 220 volt motor. I. T. I. O. Company, Bartlesville, Okla.

PUMPING Unit—Lee C. Moore #9731, 6000 lb. polished rod capacity complete with engine and 1950 lbs. counterweights for 2000' well. Practically new. Also 10' x 15' welded 210 bbl. Tank, low 250 bbl. Bolted Tank, both with complete connections. Mutual Investments, Inc., 1106 Hales Bldg., Oklahoma City, Okla.

FOR SALE
2" Upset Williamson and Meris Flow Valves. Perfect Condition. $45.00 each. JOHN W. HERBERT, 915 Neil P. Anderson Bldg., Fort Worth, Texas.

Equipment Wanted

RECORDING Pressure gauges wanted. State price, specifications and quantity. UNITED DEVELOPMENT CO., Chatham, Ontario, Canada.

Mailing Lists

ROYALTY Lists. Unit Owners Lists. Stockholders Lists. By states. Oil Industry Mailing List Co., Tulsa Loan Bldg., Tulsa Oklahoma.

New York Market

(Continued from Page 101)

forming operations. Reduction of the available supply going to make up the reforming demand caused an advance of approximately a quarter of a cent to a range of 4½ to 5 cents per gallon on straightrun material.

Crude scale grades of wax continued to enjoy the more active demand prevailing since late January and February. Some suppliers in New York and New Orleans are currently asking 2¾ cents but others are sticking to the preceding week's quotation of 2.65 cents. Fully refined waxes are also reported in more active demand and some suppliers have elevated quotations of these grades a quarter of a cent. The export demand is running considerably ahead of 1938 levels.

Crude Oil Price Changes

(Continued from Page 104)

Grass Creek, light, Wyo. (Oct. 11, 1938)*† ..... .90
Grass Creek, heavy (Oct. 11, 1938)† .40
Lance Creek, Wyo. Oct. 11, 1938)* .77
Rock Creek, Wyo. (Oct. 11, 1938)* 1.00
Iles, light, Colo. (Oct. 11, 1938)† .98
Iles, heavy, Colo. (Oct. 11, 1938)† .92
Dutton Creek, Wyo. (Oct. 11, 1938)† ..... See note below
Frannie, light, Wyo. (Oct. 11, 1938)† .55
Frannie, heavy, Wyo. (Oct. 11, 1938)† .42
Hamilton dome, Wyo. Oct. 11, 1938)† .35
Midway, Wyo. (Oct. 11, 1938)† ..... See note below
Salt Creek Tensleep crude, Wyo. (Oct. 11, 1938)† .646
Salt Creek (Oct. 11, 1938) See note below
Canon City, Colo. (Oct. 11, 1938)‡ .90
Florence, Colo. (Oct. 11, 1938)‡ .90
Cat Creek, Mont. (Oct. 11, 1938)‡ 1.10
Big Muddy, Wyo. (Oct. 11, 1938)‡ .98
Lance Creek, Wyo. (Oct. 11, 1938)‡ .77
Lea County, N. M. ..... See West Texas gravity schedule‡
Artesia, Jackson and Maljamar ..... See gravity table‡
Fort Collins and Wellington, Colo. ..... See gravity table‡
Eddy County, N. M. (October 11, 1938)† .77

*Ohio Oil Co. †Stanolind Oil & Gas Co. ‡Continental Oil Co. ¶Sinclair Prairie Oil Marketing Co.

Dutton Creek and Salt Creek Tensleep crude start at below 29 degrees, 86 cents, 2 cents spread to 40 and over at $1.10. Salt Creek crude excepting Tensleep takes Standard Oil Co. of Indiana, Oklahoma-Kansas prices. Stanolind Oil & Gas Co., effective October 11, discontinued posting prices in Greybull-Torchlight, Wyo., and Hogback and Hospah, N. M.

Eastern States

SOUTH PENN OIL CO.
(Effective March 6, 1939)
Pennsylvania Grade Oil in National Transit Lines (Bradford field) $2.00
Pennsylvania Grade Oil in Southwest Pennsylvania Lines 1.65
Pennsylvania Grade Oil in Eureka Pipe Line lines 1.59
Pennsylvania Grade Oil in Buckeye Pipe Line lines 1.55
Corning Grade Oil in Buckeye Pipe Line Co. line (Jan. 24) 1.02

TIDE WATER ASSOCIATED OIL CO. and NEW YORK TRANSIT CO.
(Effective March 6, 1939)
Bradford, Pa. $2.00
Allegany, N. Y. 2.00

PENNZOIL CO.
(Effective March 6, 1939)
Group A $1.95
Group B 1.94
Group C 1.93
Group D 1.92
Group E 1.90

PURE OIL CO.
(Effective March 6, 1939)
West Virginia $1.59

West Texas

See gravity table.
Fisher County, Tex., April 1, 1939. See note below.
Pecos County (Oct. 11, 1938)* $ .78
Pecos shallow (Oct. 11, 1938)† .65

*Shell Oil Co., Gulf Pipe Line Co. and Humble Oil & Refining Co. †Shell Oil Co. Fisher County, Tex. By Shell Oil Co. Inc., below 25 degrees 68 cents; 25 degrees, 70 cents, with 2-cent spread to 40 degrees and over at $1.

Canada

Ontario (Oct. 25, 1938)*
Petrolia $1.90
Oil Springs 1.97

TURNER VALLEY
(January 5, 1938, by Imperial Oil, Ltd.)
Clear naphtha and discolored naphtha, 65 gravity and higher $2.14
Discolored naphtha and crude oil, 40-40.9 gravity 1.14
Increasing 2 cents for each degree gravity with top price for 64-64.9 gravity 1.62
These prices f.o.b. producers' field tankage.

*Imperial Oil, Ltd.

Rocky Mountain Runs

Production estimates for week ending April 8:

WYOMING	
Salt Creek	14,840
Big Muddy	1,170
Badger Basin	150
Byron	4,860
Cody dome	40
Cole Creek	90
Dallas Derby	510
Dewey dome	10
Dutton Creek	50
Elk Basin	570
Frannie	750
Garland	1,810
Grass Creek	1,830
Hidden dome	90
Hudson	240
LaBarge	800
Lance Creek	14,490
Lost Soldier	1,770
Mahoney	250
Medicine Bow	2,200
Midway	30
Oregon Basin	1,250
Osage	700
Pilot Butte	20
Quealy dome	710
Rex Lake	10
Rock River	2,960
Spindletop	20
Poison Spider	260
Teapot	20
Warm Springs	140
Wertz	1,580
Total Wyoming	54,220
MONTANA	
Border	120
Cat Creek	540
Cut Bank	8,280
Dry Creek	370
Kevin-Sunburst	3,700
Lake Basin	10
Pondera	450
Total Montana	13,470
COLORADO	
Florence	210
Fort Collins and Wellington	320
Wilson Creek	310
Iles dome	2,130
Moffat	290
Orchard	20
Rangely	20
Tow Creek	140
Price	330
Total Colorado	3,770
NEW MEXICO	
Cooper	4,460
Eaves	860
West Eunice	110
Eunice	24,170
Hardy	3,320
Hobbs	13,440
Jal	870
Langlie	5,370
Lynch	540
Lynn	850
Mattix	3,950
Monument	24,990
North Lynch	40
Penrose	5,910
Rhoades	140
Skaggs	100
Skelly	1,840
South Eunice	3,630
South Lovington	210
Vacuum	8,790
Artesia-Maljamar	9,000
Getty	100
Hogback	200
Rattlesnake	580
Table Mesa	90
Total New Mexico	113,560
Total Rocky Mountain region	185,020

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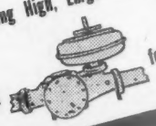

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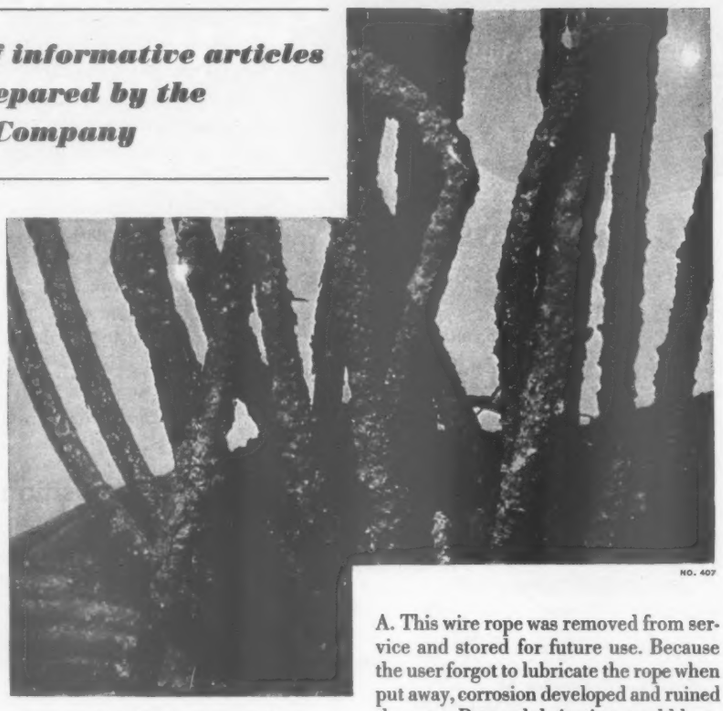
WHY CORROSION SHORTENS THE LIFE OF WIRE ROPE

Number 1 in a series of informative articles for wire rope users, prepared by the Macwhyte Wire Rope Company



NO. 407

A. This wire rope was removed from service and stored for future use. Because the user forgot to lubricate the rope when put away, corrosion developed and ruined the rope. Proper lubrication would have prevented this.

B. This rope deteriorated early in service because it was not kept properly lubricated. Notice how corrosion caused the wires to become brittle and break up.

Cause of Corrosion

Corrosion of wire rope is caused by neglect, by leaving wire rope exposed to elements without complete protection.

Effect of Corrosion

If wire rope is allowed to corrode:

1. Tensile strength is decreased;
2. Resistance to fracture from bending is diminished;
3. Resistance to impact, or shock loading, is diminished.

If corrosion of wire, or rope, is allowed to continue for any period of time, the useful life of the wire rope is completely destroyed.

Remedy for Corrosion

Continual applications of an approved lubricant will prevent corrosion. Lubricant should be applied when the rope is placed in service, and periodically thereafter. If corrosion does get a start, immediate application of a good lubricant will retard further damage.

Active Ropes and Corrosion

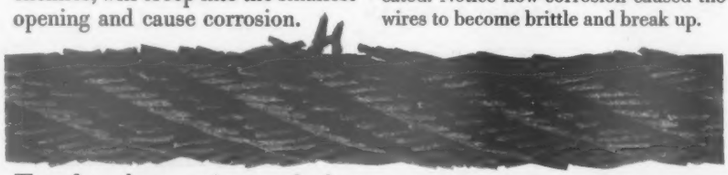
Wire ropes in constant daily services are less likely to corrode than inactive ropes. At the first sign of corrosion, however, apply lubricant. It is well to lubricate ropes regularly, not only to prevent corrosion but also to reduce wear of both rope and equipment.

Inactive Ropes and Corrosion

Corrosion strikes inactive ropes quickly, unless they're adequately protected by thorough lubrication. Be sure your ropes are thoroughly lubricated immediately when taken out of service. This protects the entire rope against all elements; keeps the rope flexible, gives it a chance to live longer.

How Proper Lubrication Helps Wire Rope Resist Corrosion

Moisture, one of wire rope's worst enemies, will creep into the smallest opening and cause corrosion.



Therefore, choose a wire rope that has been thoroughly covered, inside and out, with proper lubrication; be sure to lubricate your rope pediodically. Then you will have fewer broken wires, fewer corrosion-fatigue cracks, less uneven wearing, etc.

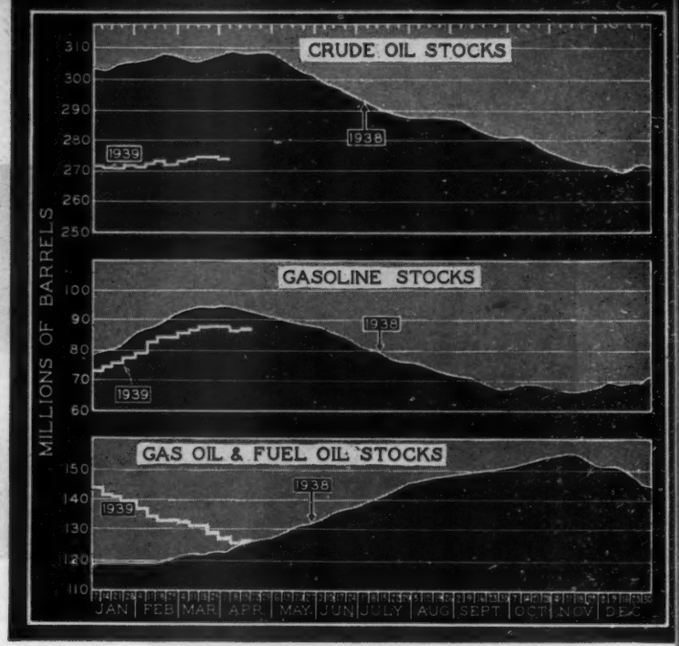
(To protect your wire rope against corrosion use an approved lubricant like Macwhyte's special lubricant which, tests show, resists moisture, clings to, and protects the wires.

Reprints Available of this and other informative articles on wire rope. Simply address: Macwhyte Company, Kenosha, Wisconsin.

MACWHYTE COMPANY, Kenosha, Wis. Manufacturers of PREformed, Internally Lubricated, Laboratory Tested, and Field Proved Wire Ropes, and Braided Wire Rope Slings for every use. New York ... Pittsburgh ... Chicago ... Ft. Worth ... Portland ... Seattle ... San Francisco. (Distributors throughout the U. S. A.)

Trends

Support Grows for Proration Periods Extending 90 Days



SUPPORT for a program which would project crude oil requirements and state allowables two or three months in advance instead of one month, as is now customary in most states, is gaining favor among operators and state officials. The benefits of such a plan were stressed at the hearing of the Texas Railroad Commission in Austin Monday, and it is known that other state proration bodies will consider it in the near future.

CRUDE PRODUCTION *3,492,057 barrels daily average — up 46,860. One year ago 3,383,543 barrels.*

CRUDE STOCKS *275,774,000 barrels as of April 8—down 345,000. One year ago 307,556,000 barrels.*

GASOLINE STOCKS *87,071,000 barrels as of April 15—up 458,000. One year ago 91,189,000 barrels.*

GAS AND FUEL OIL STOCKS *126,798,000 barrels as of April 15—up 599,000. One year ago 124,811,000 barrels.*

REFINERY RUNS *3,330,000 barrels daily week ending April 15—up 185,000. One year ago 3,189,000 barrels.*

It is felt the plan, if adopted by all the principal oil-producing states, would prove beneficial to refiners as well as producers. It is contended that under the present arrangement there is always the possibility that allowables will be materially changed from month to month and this results in uncertainty which tends to unsettle markets for both crude oil and refinery products. The sponsors of the change hope that it will be possible for the Bureau of Mines to cooperate and estimate crude demands over 60- or 90-day periods. With these forecasts, the states would then allocate crude production over the entire period. Minor adjustments could be made to take care of special conditions that might develop during the period.

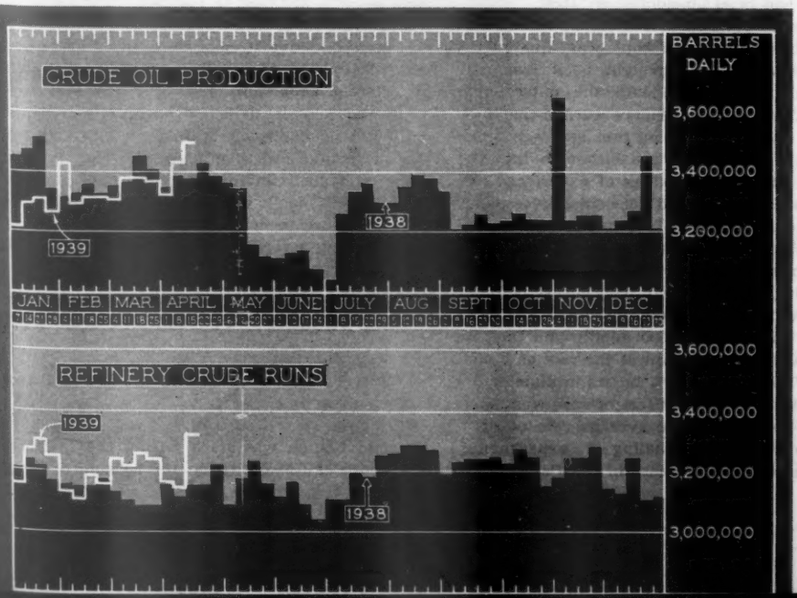
There were no final developments at the Austin hearing which would indicate the position of the Texas commission in regard to the May allowable. The expected airing of grievances, including the threat of more pipe line proration by major buyers, did not develop. Those who are making studies of conditions are in general agreement that Texas, California and Illinois are the key states over the next few months. They contend that while the May crude demand will be greater than in April, the production of the Lone Star State has been excessive this month and should not be increased next month. California, confronted with a decline of 26 per cent in shipments to Japan, its principal foreign customer, the first quarter, does not have its operations in balance.

While Illinois' production has leveled off in recent weeks, additional gains are in prospect over the next 30 days and later in the year. Support for a conservation act which would prevent any large gain in production this year is increasing, with no certainty, however, that it will receive the approval of the Illinois Legislature. Some improvement has been reported in the Illinois situation in regard to the quantity of crude selling under the market. It is claimed that this selling could be dried up 100 per cent within a short time if production was reduced to around 150,000 bbls. and kept at that level through the summer months.

Refinery gasoline markets appear to be marking time. There have been no important changes in prices recently and the Gulf Coast market, which was active the first of the month, is quiet.

DAILY AVERAGE PRODUCTION FOR WEEK

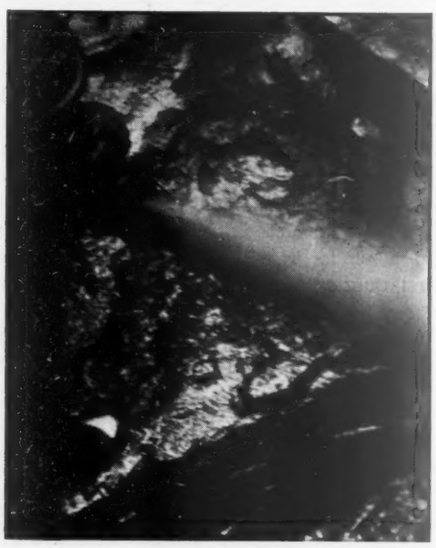
	Apr. 15, 1939	Bur. Mines Apr. est. of demand	Apr. state allowables	Apr. 8, 1939
Oklahoma City	101,675	.....	.....	114,500
Fitts	28,350	.....	.....	30,325
Remainder of state	306,450	.....	.....	307,425
Total Oklahoma	436,475	473,300	428,000	452,250
East Texas	447,000	.....	.....	447,086
West Texas	228,750	.....	.....	212,748
North Central Texas	115,850	.....	.....	115,899
Texas Panhandle	62,549	.....	.....	72,348
East Central Texas	105,048	.....	.....	105,100
Gulf Coast Texas	357,250	.....	.....	328,454
Southwest Texas	118,648	.....	.....	108,696
Total Texas	1,435,095	1,412,700	1,439,113	1,390,331
North Louisiana	73,305	.....	.....	73,455
Gulf Coast Louisiana	191,550	.....	.....	192,400
Total Louisiana	264,855	262,000	257,920	265,855
California	629,250	592,000	575,000	620,500
Kansas	169,950	152,700	156,850	153,800
Arkansas	53,380	53,300	52,993	54,185
Illinois	163,550	149,300	.....	166,439
Eastern fields	96,800	104,800	.....	98,200
Michigan	58,492	48,300	.....	58,617
New Mexico	113,580	115,300	109,700	113,560
Rocky Mountain area	70,630	70,300	.....	71,460
Total United States	3,492,057	3,434,000	.....	3,445,197



Horizontal Outcrop

Gases and steam roaring from the well before the oil came

By LEO RANNEY



The oil beginning to come

Oil gushing from the well every 40 seconds after the shot. Note pool of oil below

McCONNELSVILLE, Ohio, Apr. 17. The history of the oil industry is the life story of a few hundred pioneers, to whom a warning that a thing could not be done was a challenge to go and do it. As an example of such a challenge—instead of drilling wells that are 98 per cent through unproductive strata, why not drill them 98 per cent in pay sand? And instead of having to pump them, why not let the oil flow out by gravity? In half the oil fields of the United States this very thing can be done.

To apply this thought and reduce theory to practice required through several years the development of new drilling tools, a sure method of controlling the direction of the bit, a sure and instantaneous method of surveying the hole, a new method of loading and shooting the well, a new method of cleaning out — and finally, new methods of operating the completed wells. Experience in drilling and operating vertical wells proved valuable only as a background.

To save the cost of sinking a shaft, the location of the first horizontal oil well, 3 miles from McConnelsville, was made on an outcrop of the first Cow Run sand in Havener Run, Morgan County, Ohio, on the farm owned by Dion S. Birney, discovered by H. H. Cupler eight years ago as an oil mining site. There, from time immemorial, oil seeps furnished the Indians with Seneca oil. The principal disadvantages of the location lay in the fact that in ages past much of the oil content of the sand had seeped away, that from about 1870 the ground just back of the seeping outcrop had been drilled on every two acres, and that the wells had been subjected to vacuum, then to air pressure by the late O. C. Dunn of Marietta. With one exception all the wells on this 141 acres had declined to one-tenth of a barrel a day and had been abandoned by 1930.

A dam was built to divert the stream out of its channel and the north bank was squared up. The plan was to drill straight back from the stream bed, horizontally, into the outcropping sandstone. The diamond drillers warned that they could not drill 200 feet in this soft sandstone until gravity would pull the bit down into the underlying shale. Thirty years of experience had taught them that this could not be done. However, it was done as planned. The hole was surveyed every 100 feet and turned up or down at will within a space of 10 feet. The first branch of the well was drilled in 802 feet. The lowest point in the hole was 17 inches below the mouth, the highest point 4 inches above the mouth, and the last 150 feet was slanted upward at the rate of 1 inch in 10 feet. The well was 2⅝ inches in diameter.

On several occasions 90 feet of core was taken in a seven-hour shift. The average rate of drilling for the 802 feet, including all experiments, was 40 feet per shift. Because of the flat position of the sand grains, horizontal cores are much stronger than vertical ones—often the core was unbroken for the full length of the 31-foot core barrel. Horizontal cores of this length will bend 6 inches without breaking.

The horizontal well passed within 25 feet of an old vertical well to which vacuum, then air

Fiber cartridge 60 feet long into which gelatine was rammed along side of cordo, (TNT)

pressure, had been applied. It was interesting to note that the saturation there was about the same as at a distance of 100 feet from old wells. One of the surprising revelations was that several nonproductive streaks were found in the pay —the reason for dry holes in proven fields, within 10 feet of good wells.

In that closely drilled property three apparently untapped pockets were found. From these the oil spouted out several feet beyond the well casing. Do such untapped areas occur in other oil fields? If so, horizontal wells would be the only ones sure to reach them.

In drilling a vertical well the excitement is all over when the bit has passed through 20 or 30 feet of pay sand—but in drilling horizontally there is no disappointment in finding 20 feet barren, because there still is 1,000, 2,000 or even 3,000 feet of pay to penetrate. The sand exposure may be 100 feet or more per acre, against say 5 feet in vertical wells.

After the first branch of our well was drilled, a second branch was started from the first one at a depth of 630 feet from the rock face. From

Drilling Through Brings Results

that point a new hole was drilled to a depth of 930 feet. In one seven-hour shift 106 feet of hole was made. The drilling rig used was a conventional diamond drilling machine with a rotatable hydraulic with a 2-foot feed, powered by a 25-hp. gasoline engine. At times the drill advanced at the rate of 1 foot per minute. The rig was owned by Hoffman Brothers of Punxsutawney, Pa., and operated by their O. C. Barnett, under direction of the writer. No derrick was required.

The tools were often left in the hole overnight, since there could be no possibility of their being sanded in. There was only one fishing job, when a defective drill rod broke—and it was picked up on the first run by an overshot, in a half hour's time.

Loading and shooting the well presented new problems. The shot comprised a line of TNT and 1,150 pounds of 80 per cent high-velocity gelatine in sticks 2 inches in diameter. The TNT line (Cordeau-Bickford) was 960 feet long. The shot had to be pushed 953 feet, to the far end of the well. The sticks were slit and rammed into 15-foot fibre tubes, 2½ inches in outside diameter, with one-eighth inch walls, that had been boiled in paraffin for 10 minutes. Four tubes were joined together by inside couplings to form cartridges 60 feet long, with the TNT cord extending therethrough. F. D. Bickel and Bob Earich, of the Du Pont Co., had charge of the loading.

The loaded cartridges were pushed to the far end of the well by a wooden plug on the end of the drill rods, each cartridge being rammed against the one ahead under 500 pounds of pressure. Because there was only one-eighth of an inch of clearance around the cartridges, the well was pumped occasionally during loading, through the drill rods and a hole through the ramming block. The TNT cord of the last 60-foot cartridge (weighing 155 pounds) was threaded through the drill rods, which were backed off after the cartridge was in place. This cord extended 387 feet back from the shot to the mouth of the well. The length of the rammed shot, when in place, was 565 feet and 1 inch, and its new diameter 2¼ inches. To stem and confine the shot, water was pumped into the hole for 10 minutes under 200 pounds of pressure.

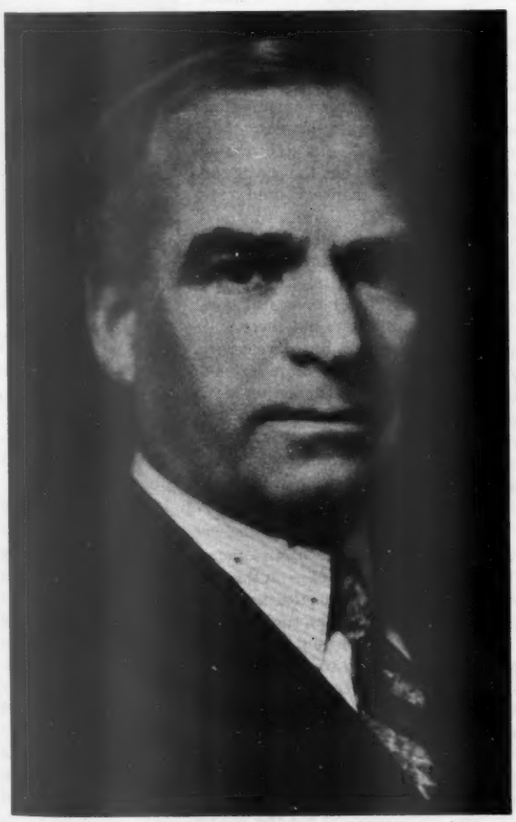
The shot was fired electrically at the mouth of the well. The ground surface was 220 feet above the shot—that much rock cover in place over the hole. Engineers of one of the major oil companies made seismographic measurements of the "jump" of the ground above the shot. The ground actually jumped upward 1½ inches. This seems to substantiate the belief of the writer that a horizontal shot is much more effective than a vertical one, since it breaks with the grain and with the bedding planes—and does not have to tear the rock apart against the grain, as in a vertical shot. There is good reason to believe that this small shot cracked the sand from top to bottom, and formed long horizontal cracks.

After shooting, the well blew for about 20 minutes, then flowed by heads every 40 seconds for about a half hour. Great quantities of pulverized sand were blown out, since there was no opposition by gravity. Such a flow of oil as came was quite unexpected, since it was known to all that seepage there had been going on for thousands of years.

Cleaning the well of pulverized sand presented another problem, since its diameter for the first 387 feet was only 2⅝ inches. (Horizontal wells should be at least 3 inches in diameter.) Space does not permit giving details of this operation, but, once going, the method removed more than 250 bbls. of sand from the hole in three days, indicating a present open diameter of more than 20 inches. No obstruction whatever was encountered clear to the back end of the well, and no piece of sand as big as a pea was recovered.

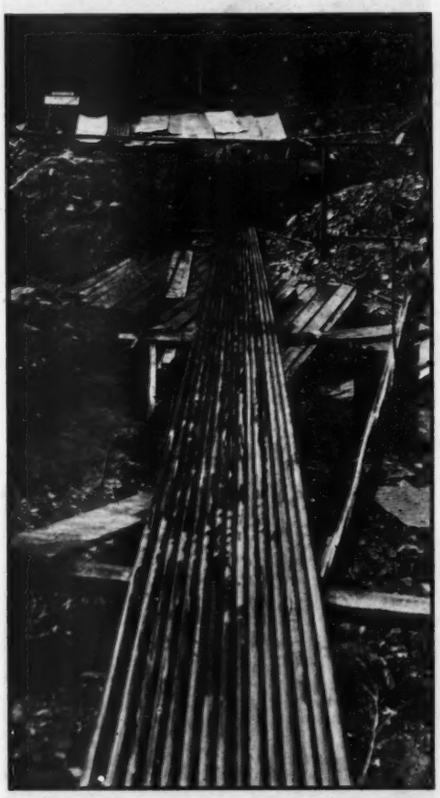
The outcrop served as a field laboratory to prove and perfect the large number of new inventions involved. But even so, the operation bids fair to be profitable, since one man can operate a dozen of these wells, where oil flows out by gravity and where there is no casing (except 40 feet)—and no tubing or pump in each well. Sand does not cut the cups, because there are no cups. The sand flows out with the oil and the wells constantly clean themselves. What the daily production of this well will be we do not know, since

(Continued on Page 82)



LEO RANNEY

The oil flowing from the well the day after the shot



Drill rods pulled out of well in 60-foot lengths

Thompson Warns California Before Los Angeles A. P. I.

Stanley Herold and J. B. Case, chief deputy, California Department of Natural Resources

REED WINTERBURN
Chief petroleum engineer, Union Pacific Railroad Co.

W. A. CLARKE
Petroleum engineer, Texas Co. (California)

By L. P. STOCKMAN

LOS ANGELES, Calif., Apr. 17.—The highlight of the Los Angeles meeting of the A.P.I. Division of Production, Pacific Coast district, was the speech of Colonel Ernest O. Thompson, member of the Texas Railroad Commission, at the session following the dinner.

Colonel Thompson's address dealt with current administrative efforts in conservation of oil and gas but his periodic deviations from the subject of his paper were especially apropos of conditions in the producing end of the California oil industry. His deductions regarding the immediate future of the industry with special reference to the advisability of reducing drilling operations were warmly received as most of the progressive California companies are following his recommendations.

Diminishing Returns

Last year, A. C. Rubel, vice president of the Union Oil Co., sponsored the same movement and while no publicity was received all of the larger operators have since eliminated all unnecessary drilling. This reduction in development work was undertaken for two basic reasons. This was to enhance curtailment as it was realized that constant completions were defeating the primary purpose of proration and secondly but not the least important was the economic factor involved. Most operators had reached the point where they recognized the law of diminishing returns and accordingly reduced the number of tools in operation. This movement has been especially pronounced in the drilling operations of all major companies and is in line with the recommendations of Colonel Thompson. Severely scoring banking institutions for indiscriminate loans and voicing the belief that the oil industry may go into the next depression with a lag in oil's own economics due to overdevelopment and a probable decline in offshore shipments Colonel Thompson minced no words in outlining his subject.

With reference to California he said, "I can plainly foresee that doubless you in California will shortly have to come to ever decreasing allowables as we have done in Texas. You will either do it by voluntary agreements or by law because you will probably not long be able to sell the oil you are now producing. It looks to me like we are going to have a weak oil market for a long time to come. It is a buyer's market. We have to average down our costs by spreading them thinner over our oil reserves. The oil compact or treaty is the only solution to the very serious problem in which we are involved. We had best get together under our compact and work out together our common problem on the basis of reserves and home markets. It is our hope that we may develop a set of laws, rules and regulations concerning conservation and proration of oil and gas that will be reasonable and fair and advantageous to the individual operator as well as the industry, that the ready acceptance and observance of them will be almost automatic."

California's rugged individualism which sponsors the position of isolation with respect to adherence to the oil compact has not changed and this policy will probably prevail indefinitely as far as the individual opinion of the operator is concerned. This position is based on the theory that the Pacific Coast states and the Orient are normal markets of California crude oil and refined products. The Colonel's recommendation that operators get together and work out a common problem on the basis of home markets and reserves is in direct contrast with prevailing opinion among operators. Some discussion might be attained on the basis of normal markets but there will be no pooling of reserves in the determination of production in conjunction with other producing states as far as current opinion is concerned.

W. F. FARRAND
General superintendent, Texas Co. (California)

One of the most important papers that received most discussion was that of John F. Dodge, E.M., on the "Economics of Deep Drilling in the San Joaquin Valley." Some very pertinent facts were brought out in this paper and in the following discussion. The author held that "granting the premise that the major portion at least of the investment in the well must be returned during its flowing and gas-lift life, the problem resolves itself into one of investment, operating expenditures, and probable returns to determine if under present conditions in the industry one may expect the cost of a deep well to be returned with a reasonable rate of interest upon the capital while invested and if so, what length of time will be required for such returns. Upon such a basis and disregarding for the moment such eventual possibilities as the removal of curtailment or increased

Ernest K. Parks, past president, A.I.M.E. California section, and Dana Hogan, president, Hogan Petroleum Co.

V. H. Wilhelm, chief petroleum engineer, Texas Co. (California), and R. E. Allen, formerly assistant California umpire

oil prices, it would require over four years flowing 300 bbls. per day, or a recovery of over 430,000 bbls. for a well to return its capital cost with 6 per cent interest, admittedly a low rate for an enterprise as filled with hazards as oil production from depths of over 2 miles. Factors which may change are allowable production rate, oil price and costs.

"Removal of curtailment and restoration of freedom of production seems quite remote from the present viewpoint. What, if any, conclusions are to be drawn from the above considerations? It would seem obvious that until the demand for oil more nearly approaches the supply, drilling should be reduced to a minimum consistent with lease obligations, particularly in the deeper fields with thin productive sands. Efforts should be made to obtain modifications of drilling requirements and offset situations should be avoided wherever possible and in every way drilling should be deferred until the need for curtailment has passed. New leases, when negotiated, should avoid the customary one string or two string obligations and stipulate completions only. Drilling time has been reduced even in deep fields to a point where a string of tools operating continuously will complete two to four times as many wells as it did 10 years ago, but the clause is still included in leases today without taking changed conditions into consideration."

Saner Drilling

R. W. French of Continental Oil Co. commended the paper and endorsed saner drilling operations. He indicated that drilling operations in the Kettleman North Dome field last year required 43 per cent less time than the same work required seven years ago and called attention to Union Oil Co. No. 1-36 Kern County Land in the Shafter district of Kern County which made in excess of 12,000 feet of hole in 39 days.

W. S. Eggleston, chief petroleum engineer of Union Oil Co., stated that drilling costs should not exceed $15 per foot in drilling a 12,000-foot hole with the total cost not to exceed $120,000 field total. Urging adoption of Mr. Dodge's proposal to use completions insteads of strings of tools, Mr. Eggleston thought drilling costs should be drastically reduced by running tools on a straight line and geared to one level instead of running one string today and 15 next week. Efficiency could also be increased by increasing the time on bottom of the hole, simplifying casing programs and improving the derrick and surface equipment.

At the business meeting, Howard C. Pyle, chairman of the Pacific Coast district, Division of Production, was reelected and W. G. Corey, treasurer, who has acted in this position since establishment of the chapter, was reelected. For Los Angeles Basin, R. N. McMaster of Chanslor Canfield Midway Oil Co. was elected vice chairman and H. C. Stone of the Texas Co. was elected vice chairman of the coastal district. M. W. Morris of Standard Oil Co. was elected vice chairman of the San Joaquin Valley district and Dave S. Kilgour of California Oil & Gas Association was elected secretary. An advisory committee was elected consisting of L. L. Aubert, chairman, of Bankline Oil Co.; Bruce Barkis, independent operator; A. H. Bell, Continental Oil Co.; E. C. Bolton, Ohio Oil Co.; L. A. Cranson, Honolulu Oil Corp.; E. G. Gaylord, Standard Oil Co.; W. H. Geis, Union Oil Co.; H. P. Grimm, Bolsa Chica Oil Co.; E. B. Hall, Hall-Baker Co.; Joseph Jensen, Tide Water Associated Oil Co.; William Keck, Jr., Superior Oil Co.; R. L. Keys, the Texas Co.; M. A. Machris, Wilshire Oil Co.; Frank A. Morgan, Richfield Oil Corp.; Howard C. Pyle, Union Oil Co., ex officio, and E. E. Pyles, Hancock Oil Co.; C. P. Watson, Seaboard Oil Co.; H. T. Wyatt, Shell Oil Co. and R. C. Patterson, U. S. Geological Survey at Taft; W. N. Lacey, California Institute of Technology; and W. L. Heater of Baroid Sales Corp.

The morning session held in the Biltmore Bowl in Los Angeles, April 11, was called to order by A. M. Sweeney, superintendent of Los Angeles Basin for Richfield Oil Corp., and the afternoon session was presided over by Paul Lehr, exploitation engineer of Shell Oil Co. The chairman of the section, Howard C. Pyle, presided over the evening session at which the election of officers was held and the principal address made by Colonel Thompson. At the dinner and evening session the attendance was placed at 800 as a conservative estimate.

ABSTRACTS OF PAPERS

GEOTHERMAL GRADIENTS IN CALIFORNIA OIL WELLS

By R. W. French
Continental Oil Co.

Subsurface temperatures have recently assumed increased importance in both theoretical and practical fields of applied petroleum engineering. The use of modern phase-equilibria concepts, volumetric reservoir relations, and thermodynamic analyses is dependent upon temperature. An aggressive study of carefully secured earth temperatures should also advance the possibilities of geological correlation, information as to effect on seismic velocities, and movement of subterranean water. Temperature considerations are primary factors in the modern technique of drilling mud treatment, chemical clean-out work, cement application, and location of setting cement outside of casing. Manufacturers of tools, instruments, and materials for oil well use are constantly meeting more serious problems. Geothermal gradients are presented for most California fields with examples of typical transient phenomena.

IMPROVEMENTS IN FORMATION TESTING

By Frank E. O'Neill
Oil Field Service Co.

The paper entitled, "Improvements in Formation Testing" discusses the design of the various present day commercial tests in use in the oil fields of

(Continued on Page 82)

Howard C. Pyle, chairman, Pacific Coast district, A.P.I. Division of Production, and M. S. Eggleston, chief petroleum engineer, Union Oil Co.

Sparta-Wilcox Developments Continue Promising

By DR. JOHN D. TODD
and FRANK C. ROPER

To those not acquainted with the facts as they developed, it now seems that the Sparta-Wilcox trend has rocketed into prominence as the outstanding development of 1939. However, this is not true. In true Roman manner, the building of this trend up to its present fervid importance has not been done in a day, but rather has taken months and years. The development has been slow; the public recognition has been sudden.

DR. JOHN D. TODD

Two years ago, at this very time, the discovery well for this trend was drilling in an unnoticed wildcat in the wooded wilds of southeastern Tyler County, Texas. If anyone had been interested in the area then (as no one was) this well could have been found listed on company drilling reports as Republic Production Co.-Houston Oil Co. No. 2 Hurd. It was the second test in this immediate vicinity, the No. 1 Hurd having been an informative but expensive dry hole.

In May of 1937, after having passed a disappointing Cockfield section, the No. 2 Hurd drilled into a saturated Wilcox sand. This was the first deep, profilic Wilcox production on the upper Gulf Coast and marked the beginning of the present Sparta-Wilcox development.

However, this discovery well attracted little or no attention for several reasons. In the first place, on a map it did not look like a new field but seemed to be only a southern extension of the Cockfield gas-producing area at Spurger. In fact the Wilcox producing area is so close to the older Cockfield production, that for nearly two years it was known in geological circles as a part of the Spurger field; and only in the past month has the name Joe's Lake field been officially recognized by the Houston Geological Society. Another reason for the failure of this well to receive notice was that it was situated entirely on the fee lands of the operators, and that it is the policy of those operators to give out no information concerning such wells. The result was that it was months before it was known, even in oil channels, that this production was from a new horizon.

The modesty of accomplishment, even to this day, causes the operating companies to belittle the importance of the Joe's Lake field. However, it is now well recognized that the Republic Production Co. and the Houston Oil Co. accomplished an epochal piece of geological pioneering. Although only one rig has been kept running since the discovery of the field and it is now only partially developed, it is now apparent that those companies have been richly rewarded for their foresight and courage, in that the first 600 feet of the Wilcox so far penetrated has yielded four prolific oil sands indicating a reserve running into hundreds of millions of barrels for the structure.

Following upon the heels of the discovery of Wilcox production at Joe's Lake, came the discovery of Sparta production at Ville Platte in September of the same year. Since several companies had holdings in the Ville Platte field, development came faster and the area attracted more attention. A lease play covering all of the parishes on strike with Evangeline, at once followed. Many exploration blocks were taken and a substantial amount of reconnaissance geophysical work was done. The results of this work were largely disappointing, and perhaps for the reason that large, flat, fault controlled structures are not detectable by reconnaissance methods.

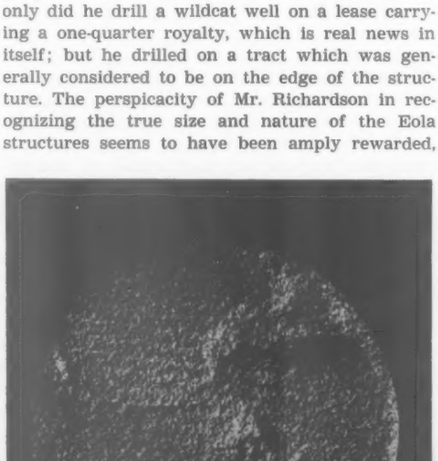
Strike at Eola

After Joe's Lake and Ville Platte came the finding of Wilcox production at Segno and Cleveland and Sparta production at Cheneyville. All of these attracted very little attention, because the finding of a new producing horizon in an old oil field never excites the imagination like the finding of a new oil field. The result was that these aggregating discoveries passed with but little notice, and the strike at Eola was the first to arouse the general interest of the oil industry.

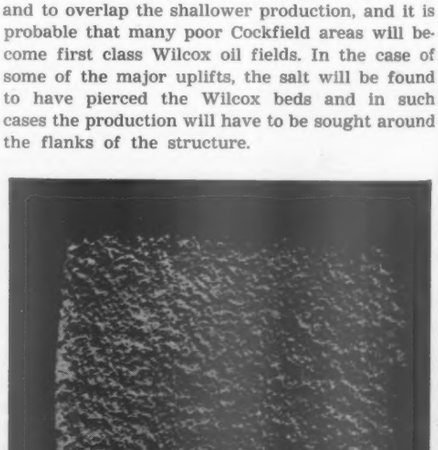
S. W. Richardson, prominent and popular independent of Fort Worth, Tex., and his associates took a burdensome lease at Eola; a lease which had been open for years, and which every company in the business knew was available. Not only did he drill a wildcat well on a lease carrying a one-quarter royalty, which is real news in itself; but he drilled on a tract which was generally considered to be on the edge of the structure. The perspicacity of Mr. Richardson in recognizing the true size and nature of the Eola structures seems to have been amply rewarded, in that it now appears that his lease may be on the very top of the structure instead of on its edge.

While the discovery well at Eola, Haas Investment Co. No. 1, is now only another prosaic producer, the field itself is now the focal point of coastal attention. With five drilling rigs carrying development eastward the Eola field presents a scene of intense activity, and it is not unlikely that there will be twice as many rigs running a few months hence. The Eola field is rapidly becoming recognized as a major strike, and in the opinion of some unusually conservative geologists it may prove to be the long awaited "Conroe of Louisiana." In any event it seems destined to rapid development, so that its actual potentialities will soon be known.

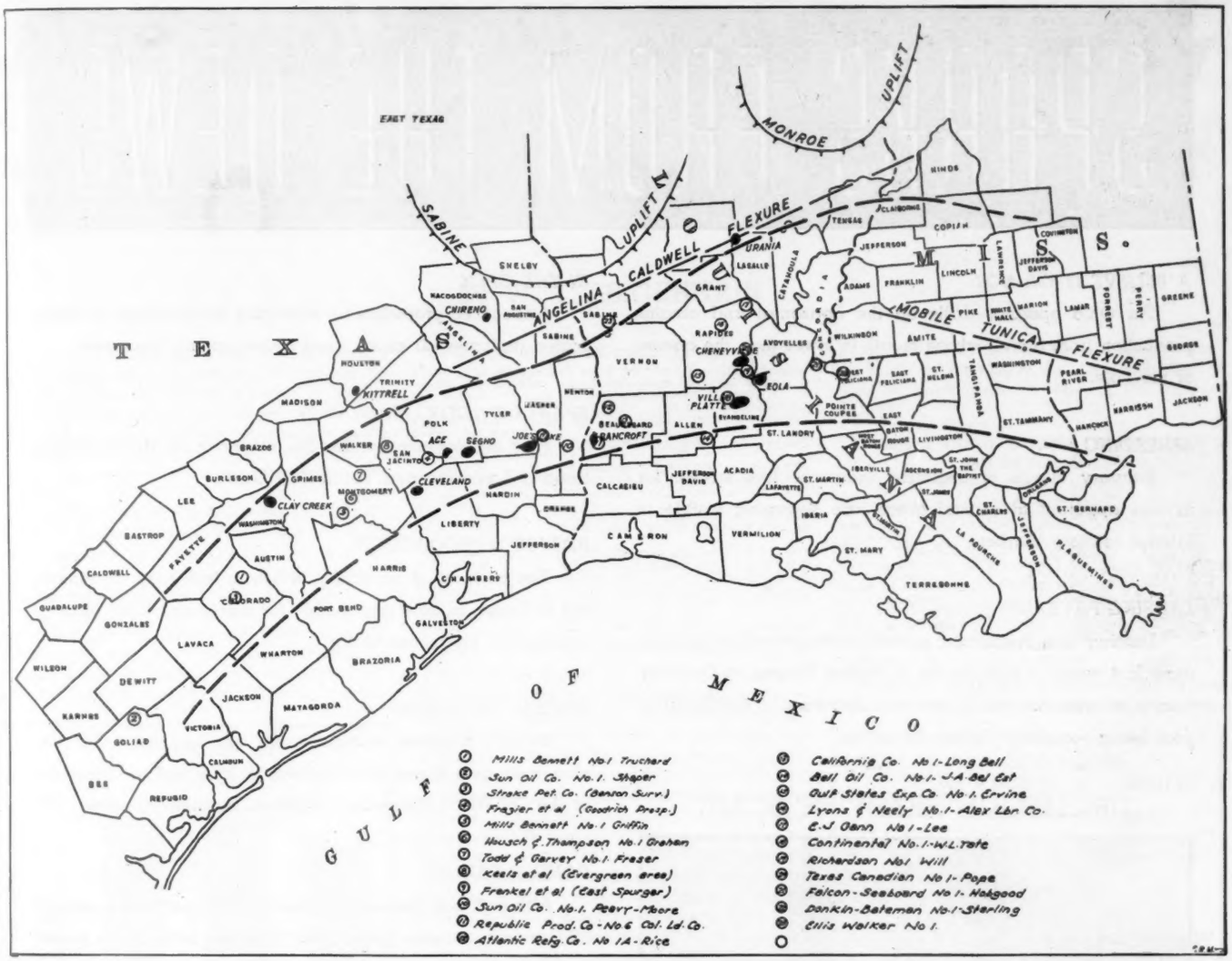
Since the discovery of the Wilcox production at Eola, another Wilcox producing area at Ace, in Polk County, Texas, has been added to the list of strikes on the Sparta-Wilcox trend. An excellent Wilcox section was encountered in the Ace well, and it is expected that the production will cover a large area. However, the Ace strike caused little flurry in oil circles because the Ace structure was already a producing field and the finding of Wilcox pay there was rather expected. In fact it is expected that most of the Cockfield structures and quasi-structures in the trend will prove productive in the Wilcox. This Wilcox production can usually be expected to cover a larger area and to overlap the shallower production, and it is probable that many poor Cockfield areas will become first class Wilcox oil fields. In the case of some of the major uplifts, the salt will be found to have pierced the Wilcox beds and in such cases the production will have to be sought around the flanks of the structure.



Wilcox sand from 8,553 feet in S. W. Richardson No. 2 Haas at Eola. Porosity, 23 per cent; permeability of 24 millidarcys and volumetric saturation of 2.53 per cent. (Photos by Fred W. Bates, paleontologist, Lafayette, La.)



Photomicrograph of piece of producing Sparta sand from Villa Platte field, Louisiana Central Land Co. No. 2, at 9,075 feet. Typical Tate sand; porosity of 26 per cent; permeability, 1,410 millidarcys and volumetric saturation of 3.64 per cent



Important wildcats and locations along the Sparta-Wilcox trend

More important to the oil fraternity than the Ace discovery are two recent dry holes farther southwest, which point to the great possibilities of the trend. The Mills Bennett No. 1 Truchard in Colorado County, Texas, shown as "1" on the accompanying map had 100 feet of sandy shale and 100 feet of sand in the upper part of the Wilcox; thus indicating that reservoir conditions are excellent as far west as Colorado County. This favorable information was a pleasant surprise, since it was feared that the Wilcox might be found to be shaley that far west . . . reasoning from the westward shaling of the Yegua section. The other important wildcat was the Sun Oil Co. No. 1 Shapper, located in northeastern Goliad County, and shown as "2" on the map. This well penetrated only 30 feet of the Wilcox section, which was found to be very sandy but carrying salt water. So far as the Sun company well gives information, it points toward very favorable sand conditions as far south as Goliad County.

Wilcox sand from S. W. Richardson No. 3 Haas, Eola field, at 8,559 feet. Porosity, 24 per cent; permeability of 28 millidarcys and volumetric saturation of 2.61 per cent

Recent Wildcats

A number of other recent wildcats have been completed which have added to our knowledge of local conditions in particular areas, and while not of the major importance of the two above mentioned wells most of the accumulating information is favorable. As shown on the map a sizeable number of wildcats are drilling and to be drilled, and each of these extends our meager information and enables us to speak with increasing assurance. At this time it seems that the Wilcox sands will be of blanket character covering county after county, as would be expected of such a marine deposit.

In addition to the wildcats drilling and to be drilled, increased interest in the trend is reflected by the great geophysical activity and the plethora of leasing. It is safe to say that there has been more land leased in the last four months in this trend than was leased in the previous four years; and that there are more geophysical crews working in the area than at any time in the past five years, and perhaps more than ever before.

Most of the commercial leasing has been on the old post Conroe prospects, with the gravity pictures and reflection anomolies being quickly and completely covered. Some of the very recent leasing has been on gravimeter prospects located within the past few months; such new gravimeter work being considered much more reliable than the earlier torsion balance surveys. Very little buying has as yet been predicated on recent reflection seismograph work, as enough of this work has not been completed to result in the finding of prospects.

More of the leasing has been done and better prices have prevailed on the Texas side, for the reason that this part of the trend has a more complete geophysical history. Chief interest has centered in San Jacinto County, with buying of considerable proportions in Newton, Jasper, Washington, Walker, Montgomery, and Grimes counties. Farther west in Texas exploration leases of the usual geophysical option form have predomi-

(Continued on Page 96)

SPARKS FROM THE NEWS

A BELIEVE IT OR NOT

An Ohio operator drills on the horizontal and obtains production from a well whose mouth is lower than the bottom of the hole.

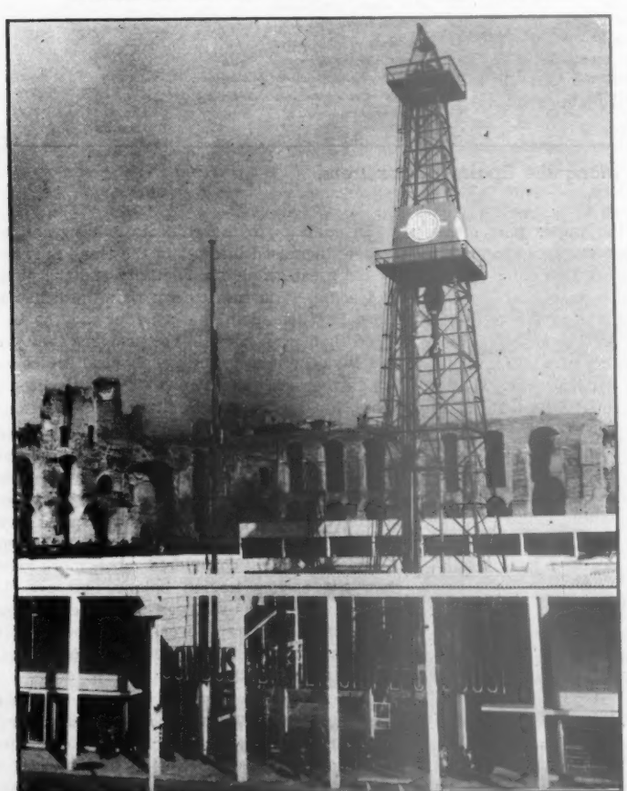
SPREADING

Salutary effects of declining industrial fuel stocks, for months apparent in coastal areas, are becoming visible in interior refinery markets.

LANSING PAYS OFF

Lansing lime exploration proved profitable to Kansas operators last week, a pool-opener in Barton County, a Cunningham pool extension and a new pay discovery in the Goodrich pool being completed in that formation.

DRILLING IN HEART OF ROME



Solbelman Syndicate

Rig, erected by Azienda Generale Italiana Petrolii at Italian Exhibition of Minerals, drilled 1,271 feet to where the River Tiber flowed before the city was built. Circus Maximus in background

IN THE OPEN

Announced procedure for monopoly investigation at Washington indicates oil critics must come out into the open.

SPARTA-WILCOX

New developments widen the interest in the Sparta-Wilcox trend of Louisiana and Texas Gulf Coast.

RECYCLED PRODUCTION

The new art of recycling, which is less than 15 months old in Texas, is now responsible for more than 2,000 bbls. of condensate production daily.

DISPLAY OF WARES

Several hundred manufacturers and suppliers will display their new wares to thousands of prospective customers at the Oil-World Exposition, Houston, starting Monday.

DANGER SIGNAL

Although gasoline consumption in 1939 promises to exceed all previous records, retail price wars will have to be ended if it is to mean profits for either refiner or marketer.

NEW ANGLE

The action of a Tulsa grand jury in bringing indictments against 143 union officials and refinery employes on strike presents a new angle as to responsibility in labor disputes.

UNITED OPPOSITION

The N.P.A. forum at Cleveland clearly reflected the opposition of oil men to the recent recommendations of the Energy Resources Committee pointing to extension of federal control.

PLENTY OF EVIDENCE

Hearings being held by a legislative committee are bringing to light many reasons why Illinois oil operators should be protected with an adequate conservation act.

RECORD IMPROVING

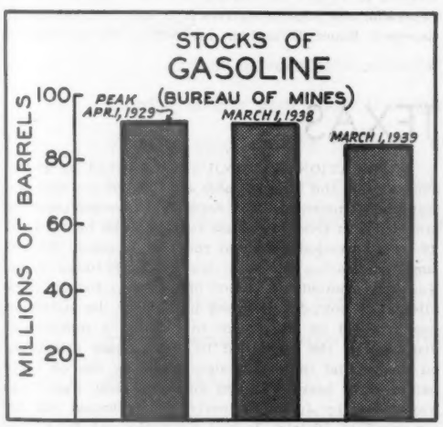
Oklahoma wildcat record is showing improvement, current discoveries including oil pools in Stephens and Oklahoma counties, a gas pool in Creek County and a deep pay zone in the old Brown pool, Garfield County.

Inventory Situation Showing Improvement Over Year Ago

By W. T. ZIEGENHAIN

Year after year, the oil industry has witnessed declining gasoline inventories beginning in April followed by a period of increasing inventories starting in November. Each year, since 1934, the peak has been extended and in the fall stocks have not been drawn down quite as low as they were on the same date in the previous year.

For 1939, however, the continuity of the cycle has been broken. Gasoline stocks will not establish a new peak this year. Latest reports of the Bureau of Mines indicate an unusually high rate of gasoline consumption for the first quarter of 1939 to permit the assumption being made that gasoline stocks are already well past their high point for the year. The transition from adding to gasoline stocks to drawing upon stocks came late in March and the industry may expect to continue



this course for about six months. On March 1 gasoline stocks were 7 million barrels less than on the same date a year ago.

According to the latest Bureau of Mines data, an equally optimistic position may be assumed toward oil inventories in general—stocks of crude oil are about 33 million barrels less than a year ago and stocks of all oils are 28 million barrels less. The only important inventories which are larger than a year ago are those of combined gas oil and fuel oils which on March 1 were about 9 million barrels higher. Since then, however, weekly estimates from the American Petroleum Institute indicate these stocks have dropped rapidly and present inventories stand at about the same level as a year ago.

Crude Oil Stocks

For example, of the 33 million barrel drop in crude inventories in the past year, 25 million barrels of it came from storage in Oklahoma, Kansas, and North Texas. East Texas, West Texas, and New Mexico were the only other important areas to show substantial reductions. Additions were recorded in California, Illinois, and Indiana and along the Gulf Coast. The detailed data are shown in the following table:

CRUDE OIL STOCKS BY DISTRICTS AND ORIGIN

(Bureau of Mines data as of March 1 including domestic and foreign oil at refineries, in pipe lines, and on tank farms and leases—barrels)

	1939	1938	Difference
Pennsylvania Grade	5,315,000	4,857,000	+458,000
Other Appalachian (incl. Ky.)	1,298,000	1,110,000	+188,000
Lima-N. E. Ind. and Mich.	1,764,000	1,323,000	+441,000
Ill.-S. W. Ind.	11,584,000	9,557,000	+2,027,000
N. La. and Ark.	8,336,000	9,835,000	—1,499,000
W. Tex. and S. E. New Mexico	23,098,000	30,400,000	—7,302,000
East Texas	19,911,000	28,086,000	—8,175,000
Okla., Kans., and N. Tex., etc.	103,577,000	128,984,000	—25,407,000
Gulf Coast	28,328,000	25,221,000	+3,107,000
Rocky Mountain	20,589,000	24,477,000	—3,888,000
California	35,145,000	27,278,000	+7,867,000
Foreign	3,298,000	3,495,000	—197,000
On producers' leases	11,173,000	11,726,000	—553,000
Total	273,416,000	306,349,000	—32,933,000

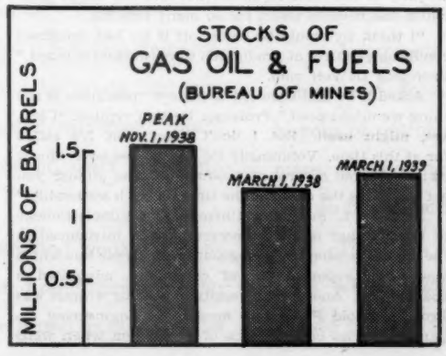
Recognition should be taken of the relatively low inventories of crude held in all important refining areas. Total refinable crude stocks approximate only 273 million barrels, while a year ago they stood at 306 million, and as recently as September 1, 1937, they stood at 311 million. The total on September of 311 million barrels is sometimes referred to as the "recent peak." The all-time peak was reported November 1, 1929, when comparable stocks stood at 433 million. The latter figure excludes 111,685,000 bbls. of heavy California crude which could not be refined and was suitable only as fuel. It is now classified as fuel in most compilations of inventory data.

GASOLINE STOCKS AT REFINERIES BY DISTRICTS

(Bureau of Mines data as of March 1, in barrels)

	1939	1938	Difference
East Coast	20,396,000	22,370,000	—1,974,000
Appalachian	3,631,000	4,046,000	—415,000
Ind., Ill., Ky., etc.	15,490,000	16,338,000	—848,000
Okla., Kans., Mo.	8,709,000	8,831,000	—122,000
Texas Inland	2,605,000	3,105,000	—500,000
Texas Gulf	12,771,000	15,182,000	—2,411,000
Louisiana Gulf	2,737,000	2,510,000	+227,000
Ark., La. Inland	659,000	729,000	—70,000
Rocky Mountain	2,175,000	2,648,000	—473,000
California	16,318,000	16,521,000	—203,000
Total U. S.	85,491,000	92,280,000	—6,789,000

The largest declines in gasoline inventories compared with those of a year ago appear on the Gulf Coast and East Coast. California, the Mid-Continent and the Indiana-Illinois groups of refineries recorded lower inventories but not in proportion to their relative importance. The all-time peak of gasoline inventories was witnessed on April 1, 1938, when 92,320,000 bbls. were in



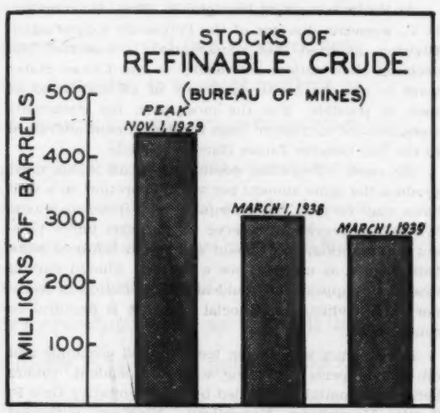
storage and it may be interesting to compare gasoline stocks by districts at that time with those in these same districts as of March 1. The comparison follows:

GASOLINE STOCKS AT THEIR ALL-TIME PEAK AND ON MARCH 1

(Bureau of Mines, barrels)

	All-time peak Apr. 1, 1938	This year (Mar. 1, 1939)
East Coast	23,249,000	20,396,000
Appalachian	3,788,000	3,631,000
Indiana, Illinois, etc.	15,972,000	15,490,000
Okla., Kans., Mo.	8,252,000	8,709,000
Texas Inland	3,047,000	2,605,000
Texas Gulf	15,088,000	12,771,000
Louisiana Gulf	2,662,000	2,737,000
Ark., and No. La.	684,000	659,000
Rocky Mountains	2,655,000	2,175,000
California	16,923,000	16,318,000
Total U. S.	92,320,000	85,491,000

From the above data it is interesting to note that on March 1 of this year gasoline stocks were



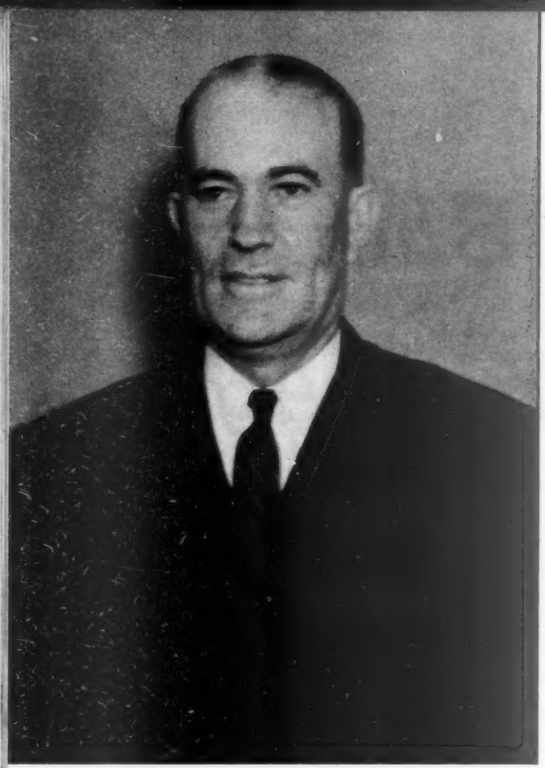
about 8 per cent less than peak gasoline stocks a year ago and we are now entering a period of higher estimated consumption than a year ago.

As of March 1 of this year the stocks of gas oil plus all grades of fuel oils totaled 114,325,000 bbls.; this compares with 105,638,000 bbls. one year previous. On this basis the combined stocks were about 9 million barrels higher this year. When adjustments are made for the effect of adding heavy California crude inventories for each year, the approximate difference of 9 million barrels remains unchanged.

GAS OIL AND FUEL OIL STOCKS AT REFINERIES BY DISTRICTS

(Bureau of Mines data as of March 1, including distillate and residual fuels—barrels)

	1939	1938	Difference
East Coast	8,888,000	10,324,000	—1,436,000
Appalachian	828,000	1,254,000	—426,000
Ind., Ill., Ky., etc.	5,718,000	6,883,000	—1,165,000
Okla., Kans., Mo.	4,693,000	4,075,000	+618,000
Texas Inland	2,308,000	1,849,000	+459,000
Texas Gulf	8,621,000	10,462,000	—1,841,000
Louisiana Gulf	1,528,000	3,125,000	—1,597,000
Ark., La. inland	726,000	567,000	+159,000
Rocky Mountain	849,000	779,000	+70,000
California	80,166,000	66,320,000	+13,846,000
Total U. S.	114,325,000	105,638,000	+8,687,000
Heavy California crude	16,360,000	15,563,000	+797,000
All fuel oil stocks	130,685,000	121,201,000	+9,484,000



ERNEST E. PYLES, vice president of Hancock Oil Co. and vice president and treasurer of Southwest Exploration Co., was born in Texas. He secured a job in the California fields in 1909, working from 12 to 18 hours per day. In 1938 he was elected chairman of the Emergency Executive Committee and late in 1938 secured a temporary leave of absence from his various duties and concentrated his efforts in preventing a collapse of proration. He is at present in charge of operations of Long Beach Oil Development Co.

STATE CAPITALS

ILLINOIS

A PREPONDERANCE OF TESTIMONY favoring oil conservation in Illinois was heard on Friday, April 14, at Champaign by a committee of the Illinois Legislature.

The committee was appointed to study the oil situation in the state and had previously held sessions in Salem, and will convene again on April 21 at Centralia.

At Friday's meeting Dr. John W. Frey, Washington, D. C., associate director of the Petroleum Conservation Division, asserted that conservation is essential. He declared alien nations unfriendly to the United States want to see the country's supply of oil exhausted as soon as possible. For the most part, his statements were devoted to a letter from his department addressed to the late Senator James Hamilton Lewis.

He read: "Proration doesn't mean all states must produce the same amount per well. Proration on a well basis may or may not be equitable to prevent waste. We have a proved oil reserve for 15 years under present consumption. We should add to our national bank balance just as much as we withdraw. Should our oil reserves disappear we would face a revolution in transportation, industry and social life that is dreadful to contemplate."

Doctor Frey was among technical, oil economic and oil legal experts appearing with independent owners before the committee headed by Representative Oral P. Tuttle, Harrisburg, Republican. Nineteen witnesses were called. April 21 another hearing will be held in the community room, Centralia, Chairman Tuttle announced. He said those not heard at Friday's meeting would be given an opportunity to testify at the next hearing.

Doctor Frey, continuing his statements, declared the committee's actions should be on a patriotic basis, rather than the desires of a few who are seeking to get rich quick regardless of what it means to the nation as a whole. He pointed out how conservation has a stabilizing effect. The oil industry has to be stabilized financially before much progress can be made or conservation considered, he added. No operator, he declared, should be permitted to waste petroleum.

"The Department of Interior is glad to know Illinois is considering the possibility of more effective production methods," said Dr. Frey. "And the Department of Interior hopes Illinois will pass legislation preventing avoidable waste."

G. H. Blankenship, Centralia, independent producer, spoke for conservation. He favored a ratable basis to prevent the price of oil from sinking to an unprofitable level.

"We have the worst kind of proration in Illinois today. It prorates the independents and not the large majors controlling the pipe lines. In many cases we must sell under the market price in order to realize on our holdings. If proration were voted and we were sure of a long-lived field, we would drill more wells and it would induce real refineries, not skimming plants, to move into Illinois. If I knew I could produce 50 bbls. per well per day I could drill wells from now on out in Illinois.

"Without proper regulation we can't regulate the irresponsible person drilling. He not only ruins the sand, but coal. If we don't maintain the price of crude oil we're going to ruin the coal industry. Cheap crude oil means cheap coal.

"It is my idea to put a minimum of not less than 40 bbls. per day per well on the new fields only. We need no proration on the old oil fields. It would be my thought to have a commission appointed by the governor with the approval of this committee which would regulate drilling, plugging, spacing and other factors involved."

Mr. Blankenship supported a suggestion by L. A. Mylius, Vandalia, consulting engineer and geologist, of placing oil legislation under the Illinois State Geological Survey here for research work.

Dr. A. H. Bell, geologist, Illinois State Geological Survey, presented figures illustrating need for conservation as well as adequate spacing and offset drilling legislation. Dr. W. F. Voskuil, mineral economist, Illinois Geological Survey, spoke on the strategic position Illinois holds as a market center for petroleum. He also answered questions on the so-called posted price, saying that in the long run it is controlled by supply and demand. Given time he believes the present congested condition may right itself to the flow from the Illinois fields.

Prof. Frank W. DeWolf, head, University of Illinois geology and geography department, deplored the instability of the nation's oil market and the cut in price which has been in effect for so many months.

"I think we would be better off if we had stabilized conditions; control of production to reasonable demand," Professor DeWolf said.

Asked if he had been led to believe "proration is the thing we might need," Professor DeWolf replied: "I say, yes, might need. But I don't know that it's called for at this time. Voluntarily I'd hate to see government ownership and control of production. The oftener you get in a mess the closer is the time for such ownership."

Prof. W. L. Summers, University of Illinois College of Law, author of the Summers oil bill, introduced in the special session of the legislature last year but which was never reported out of committee, advocated a spacing law. Another University of Illinois witness was Prof. Reinhold F. Larson, mechanical engineering department, who believes lack of production when wells are closed will not injure isolated wells. He suggested a rule which would permit each well to work out its most efficient and economical operation.

Clarence T. Smith, Flora, lawyer, owner of 10 oil wells, opposed the proration opinion. He thinks if no such law were passed the problem would adjust itself. He said it is definitely known that if Illinois will not enact proration legislation certain pipe-line and refining companies will come into the state.

Mr. Mylius, when called, admitted he believed oil possible in all parts of Illinois. He also thinks a better law on plugging essential.

Lynn K. Lee, Olney, geologist, Pure Oil Co., was against a conservation law, saying there is no particular need for a law at present because of daily production.

Maxwell Miller, Mattoon, geologist, Texas Co., advocated conservation legislation. He agreed wide-open wells diminish gas supplies essential to efficient operation. William C. Kneale, Mattoon, geologist, district superintendent, Texas Co.; Vernon Jones, Mattoon, geologist, Magnolia Petroleum Co.; C. J. Hares, Marshall, geologist, Ohio Oil Co.; Perry S. McClure, Evansville, Ind., geologist; and Ernest G. Robinson, Centralia, district superintendent, Shell Oil Co., Inc., agreed on proration needs.

William Young, Centralia Coal Co., declared abandoned wells not properly plugged endanger men working in mines. He said he was interested in seeing the price of crude oil maintained at the highest possible level. He also favors proration.

Russell G. Brown, Washington general counsel, Independent Petroleum Association of America, read a statement urging adoption of conservation laws. He said nearly all independent operators are in favor of such action.

Hearing the testimony with Chairman Tuttle were Senator Peter P. Kiel minski, Chicago; Representative Everett R. Peters, St. Joseph; Senator John J. Parish, Centralia, and Representatives R. J. Branson, Centralia; George J. Bauer, Effingham, and Sidney Parker, Texico.

TEXAS

APPLICATION FOR INJUNCTION, filed by Harrison Oil Co. and Abercrombie Oil Co., to restrain the Railroad Commission from enforcing its order reducing allowables in five Gulf Coast fields will be heard April 28 by a three-judge federal court at Houston. By setting the hearing for that date, Federal Judge T. M. Kennerly granted the motion of attorneys for the commission to postpone the case until after the statewide hearing held on Monday of this week. A motion for dismissal of the suit filed by commission attorneys, on the ground that complaints made by the oil companies have been remedied since the suit was filed, was denied by Judge Kennerly. The tribunal will be composed of District Judges Kennerly and R. J. McMillan of San Antonio and U. S. Circuit Judge Edwin R. Holmes of New Orleans.

AN EMERGENCY ORDER ADOPTING RULES and regulations for the North Houston field, Harris County, was issued by the Railroad Commission last week. The order placed well spacing at 933 feet between wells and 466 feet from property lines; provided that where a tract contains as much as 20 acres but is so irregular as to shape that a well cannot be spaced thereon in accordance with the above pattern, the commission will grant exceptions as are necessary. It further states that the field is to be divided into tracts of approximately 20 acres, each such producing tract to be a proration unit and each producing tract of less than 20 acres a fractional proration unit. A tolerance of 10 acres was allowed on producing tracts of more than 20 acres.

KANSAS

ALLOWABLE PRODUCTION IN KANSAS for the months of April and May will be announced by the Kansas Corporation Commission following a hearing at Wichita on April 25. Purchasers of crude oil have been notified to make known their requirements of crude during the period at this meeting.

The OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

Published weekly by The Petroleum Publishing Company at Tulsa, Oklahoma

Actual and Fictitious

A producer complains: "You tell us that demand for refinery products is running ahead of last year and yet most producers are compelled to curtail their output under last year and I note national production is less than in 1938. What's the answer?"

This producer and others who have made similar observations think they have pointed to a paradox—but they haven't.

Without going into the detailed data, here are the facts:

Latest government reports covering the first two months of this year show that the total demand for gasoline is running 6½ per cent greater than last year; kerosene, 11 per cent; gas oil and light fuels, 18 per cent; residual fuels, lubricating oils and petroleum wax, 9 per cent.

These figures unquestionably indicate that a new yearly record in sales of petroleum products will be established in 1939.

Despite this situation the total demand for crude oil so far this year shows a slight decrease.

A year ago the comparison was in direct contrast. The overall shipments of most finished products were substantially under the same period in 1937, while the reported outlets for crude showed an increase of better than 6 per cent.

Why these contradictory trends? The answer is the difference between an actual and a fictitious demand.

Last year there was a demand for crude that was misleading. Crude buyers nominated increased quantities of crude for which there was no need based on the market for finished products.

This reveals one of the outstanding weaknesses in the method of estimating demand and determining allowables. Too often they have been based partly on the fact that refiners exaggerated their requirements, or were forced to take crude by their pipe lines and crude production connections. They refined this excess crude oil into finished products and ran it to storage.

Comparative stock figures reveal additional evidence pertinent to this situation. The first two months of last year, total stocks of all oils increased more than 18,500,000 bbls. while this year in the same period there has been a slight decline.

Most of the increase in stocks last year was in the heavy fuels but developments proved that running these oils to storage is just as disturbing to general markets as are unwarranted gains in gasoline and crude inventories.

The significance from the standpoint of markets is equally apparent. Last year there was a steady decline in practically all finished products. The unsatisfactory earnings for the year were a direct result.

While this year's operations have not been all that was hoped for, particularly in regard to gasoline stocks, they have been on a sounder basis than they were last year. Prices have firmed with an unward trend under way in a few products. If this relative position between output and shipments continues through the summer, refiners should be able to recover ground lost last year.

The only sound demand for crude is that determined by actual sales to consumers. Requirements calculated upon any other basis mean trouble for everyone.

Appraisals could and should be made at regular intervals to determine the position of these millions of buyers of petroleum products. The industry should pay more attention to the meters of its service stations and less to those located in the fields and refineries.

This year's developments furnish an object lesson from which state regulatory bodies and the industry should profit in future operations.

Mid-Continent Employes Are Warned By Company

Mid-Continent Petroleum Corp. announced that, in view of the $750,000 construction program being planned for the West Tulsa refinery, all striking employes who have not been discharged by the company "for cause" must return to work or "their places will be permanently filled." J. C. Denton, vice president and spokesman for the company, indicated that positions for these men could not be held open any longer.

In a letter made public, Mr. Denton said:

"From the beginning, the position of our companies has been that we did not want the men to quit, but after the sit-down strike took place we were compelled under the law, and in the interest of the companies, to discharge those guilty of violence or wrongful acts in relation to the companies' property or to loyal employes; yet at the same time, the companies offered to reinstate on their jobs, as plant operations justified, with plant seniority rights, all employes not discharged for wrongful acts, and that as to these discharged employes, the companies were ready and willing, as the written contract between the companies and such employes provides, to review the evidence of the alleged acts for which the discharges for cause were made.

"Now that the Supreme Court, the governor of the state and the commissioner of conciliation of the United States Department of Labor have proposed a settlement with honor and justice to both sides, and which the companies have been ready and willing to comply with, we are hopeful that the striking employes will in the near future agree to the governor's proposal and that an amicable settlement of the strike may be brought about in the interests of the parties concerned, and particularly of the public, which has been seriously affected."

Wholesale arrest of 140 striking members of the Oil Workers International Union under indictments returned by the Tulsa County grand jury was begun early this week. Indictments for unlawful assembly, conspiracy, and directing a riot, against strikers, were handed to Judge Rowe by Frank M. Johnson, tax agent for Oklahoma Pipe Line Co., foreman of the grand jury.

THE MARKETS*

CRUDE OIL: *A 4-cent per barrel crude price advance was made in the West Branch and Arenac fields in Michigan, and a 10-cent advance in the Allegan and Kent County fields in Michigan. A 5-cent reduction was made in the Birk City, Kentucky, field.*

REFINERY: *Gasoline gaining strength, but handicapped by weak retail markets. Heavy industrial fuel firmer. Light heating oils sagging. Lubricating oils steadier. Naturals holding. Wax tight.*

TANK-WAGON AND POSTED DEALER: *Changes unimportant. Minor advances at scattered points.*

FINANCIAL: *Oils joined the other shares in regaining some of the ground lost during the week's slump. Average of 30 representative stocks for week ending April 15: High, 24.89; low, 22.64; close, 24.57. Week ending April 8: High, 25.72; low, 23.09; close, 23.15.*

ANNUAL REPORTS†

	Net income	Earned per share
Consolidated Oil Corp.:		
1938	$7,737,712	$1.48
1937	20,809,295	0.55
Imperial Oil, Ltd.:		
1938	25,959,580	0.96
1937	26,452,157	0.98
Mid-Continent Petroleum:		
1938	1,043,792	0.56
1937	5,304,877	2.86
Mountain Producers:		
1938	989,807	0.62
1937	1,213,046	0.76
Mission Corp.:		
1938	1,427,829	1.04
1937	1,807,686	1.31
Ohio Oil Co.:		
1938	4,582,964	0.25
1937	11,862,107	1.31
Barber Asphalt Corp.:		
1938	‡332,822	‡0.85
1937	743,897	1.91
Pan American P. & T.:		
1938	363,275	0.08
1937	5,539,384	1.18
Texon Oil & Land Co.:		
1938	525,243	0.56
1937	481,069	0.51
Chesebrough Mfg. Co.:		
1938	638,514	5.32
1937	807,335	6.73
British American Oil Co., Ltd.:		
1938	3,491,648	1.26
1937	3,411,851	1.30
Standard of California:		
1938	28,875,653	2.20
1937	41,254,778	3.15

*Additional information in Market section. †Furnished by Carl H. Pforzheimer, New York. ‡Deficit.

J. C. Day Elected Secretary By W.P.R.A. Directors

John C. Day was elected secretary at a meeting of the board of directors of the Western Petroleum Refiners Association Tuesday and Miss M. C. Collins was chosen treasurer.

The directors outlined the activities for the coming year and the appointment of committees and subcommittees namely: Manufacturing committee, L. D. Mann, Cities Service Oil Co., chairman; cracking plant inspection committee, W. F. Sims, Panhandle Refining Co., chairman; octane committee, C. L. Mahyall, Anderson-Prichard Oil Corp., chairman, H. W. Camp, Cities Service Oil Co., co-chairman; tractor fuel committee, W. J. Carthus, Deep Rock Oil Corp., chairman; Diesel fuel committee, T. B. Rendell, Shell Oil Co., Inc., chairman; lubricants committee, W. E. Moody, Deep Rock Oil Corp., chairman.

Maritime Union Calls Strike On Six Tanker Companies

NEW YORK, Apr. 18.—Crews of 184 tankers operated by six leading bulk oil carriers were called ashore from their ships last midnight in response to a strike call issued April 13 by the National Maritime Union, affiliate of C.I.O. The union announced negotiations had been broken off after the companies refused to meet all its "fundamental" demands. The union had previously set April 17 as the deadline, and calls for a strike went out to Atlantic and Gulf ports.

Negotiations had been held with the Standard of New Jersey labor committee for several weeks, but the company balked at the closed shop and the union hiring hall. All other demands, including wages, had been compromised.

The employers involved were Standard Oil Co. of New Jersey, Socony-Vacuum Oil Co., Inc., Gulf Refining Co., Pennsylvania Shipping Co., Tide Water Associated Oil Co., and C. D. Mallory Co. The union has negotiated agreements with Sinclair, Pan American, Kellogg Steamship Co., and Bulk Oil Carriers Corp.

The union said it had been informed by the National Maritime Labor Commission that the Pennsylvania Shipping Co. had agreed to the preferential hiring clause.

Hearings on Connally Act Set for April 26-27

WASHINGTON, D. C., April 17.—Hearings on the bill to extend the Connally hot-oil act as permanent legislation will be held before a subcommittee of the house committee on interstate and foreign commerce April 26 and 27, at 2 p.m. each day. A bill to make the law permanent has already passed the Senate and this and an identical House bill are before the committee. Limitation of the hearings to two afternoons indicates the committee will rely largely on the hearings held two years ago when the Senate voted to make the law permanent and the House insisted on extending it for another two years only.

Oil Burner Conference Called at Washington

Oil burner manufacturers and interested users have been called to meet in Washington April 27 for a conference by the National Bureau of Standards, Department of Commerce. The conference will open at 10 a.m. in the departmental auditorium.

The bureau urges that users of oil burners, as well as the manufacturers, distributors and installing contractors of mechanical draft oil burners, be present in order that the proposed standards may be adjusted as far as practicable to the satisfaction of all concerned. Among the subjects to be discussed at the conference are performance efficiency, noise elimination and methods of tests both in the laboratory and after installation of burners using the mechanical type draft.

ILLINOIS BASIN SCOUTS ASSOCIATION

Front row: Noel Engel, Superior Oil Co. of California; Bill De Mars, Texas Co.; Mickey McMullin, Shell Oil Co., Inc.; Cliff Bell, Kingwood Oil Co.; Tommy Patten, Tide Water Associated; Jack Kaufman, W. C. McBride, Inc.

Center row: Earl Westmoreland, Carter Oil Co.; Bill Tracey, Ohio Oil Co.; Gene Romine, Gulf Oil Corp.; Earl Wooldridge, Continental Oil Co.; Jack Deardorff, Transwestern Oil Co.; Jerry Simpson, Skelly Oil Co.; Ellis Stallard, Carter Oil Co.; H. A. Sackman, Phillips Petroleum Co.; Johnny Mulligan, Magnolia Petroleum Co.; Rex Staplin, Cities Service Oil Co.

Rear row: Paul Duffield, Texas Co.; Alan Emerson, Sun Oil Co.; Walter Wilson, Pure Oil Co.; W. L. Calvert, Ohio Fuel Supply Co.; Jim Carlton, State Geological Survey; J. F. Michaels, Amerada Petroleum Corp.; Bert Llwyd, Exchange Oil Co. (Sinclair Prairie); Ralph Kimsey, Eason Oil Co.; Walter Watson, Adams Oil & Gas Co.; Paul Trees, Gulf Oil Corp.; Max Engle, Indian Territory Illuminating Oil Co.; Dick Chapman, Stanolind Oil & Gas Co.; Ed Norton, British American Producing Co.

Procedure for Oil Hearing Set Out By T. N. E. C. Officials

By HENRY D. RALPH

WASHINGTON, D. C., Apr. 17.—The announcement that the oil industry has been asked to investigate itself before the Temporary National Economic Committee has created something of a sensation in business circles. Other industries are making overtures to T.N.E.C. to see if they will be invited to tell their own stories in their own way, and business men generally are hailing the announcement as evidence that the T.N.E.C. is doing its part in the "business appeasement" program by trading the role of prosecutor for that of referee.

Committee officials frankly state the new procedure is an experiment, and its extension to other industries will depend upon how well the oil industry succeeds in giving a complete, truthful, and comprehensive picture of the play of the forces of concentration and competition which enter into what is frequently referred to as the "monopoly problem." To those perennial critics of the oil business who may complain that the Government is "letting them down" by not going after the majors hammer and tongs without mercy, they reply that anyone who has a legitimate complaint to make or pertinent facts to present will be assured of a hearing.

Dissatisfied independents and other members of the industry and also consumers and critics from outside the industry can supply the committee with questions which they feel various witnesses should be asked and they may appear in person and be examined in their turn. But all critics must make their complaints openly; they cannot simply tip off the Department of Justice or the Federal Trade Commission and stay in the background while government prosecutors attempt to work up their cases for them.

Under the procedure outlined, every prospective witness will submit his testimony in writing in advance, and this will be made public, and when he testifies he will be under oath. Even though he appears voluntarily he will be subpoenaed so if his disclosures are criticized he can rely on the fact he was in the status of a government witness. Before appearing he will be given a list of questions to be asked on cross-examination, and it is probable these questions, or some of them, will also be made public in advance.

The very considerable amount of information on the oil industry already in the possession of various government agencies will be used as a check against the testimony submitted by industry witnesses and in the preparation of cross examination. It is realized the preparation by the industry may take longer than anticipated, and, if necessary, the start of the oil hearings may be delayed beyond the tentative date of June 1. Once the hearings open they are expected to run continuously for at least two weeks. Witnesses will be asked to avoid duplication and repetition as much as possible through advance agreements dividing the subjects to be covered.

Some time before the hearing T.N.E.C. may release a list of witnesses scheduled by that time and may also give out a general outline of material to be presented and the questions to be asked, but this has not yet been decided. In the meantime committee members and staff officials say the initial agenda will be submitted by the witnesses being lined up by Axtell J. Byles, president of the A.P.I., but it is well understood the material to be presented should have a direct bearing on matters which T.N.E.C. is studying.

The range of subjects to be covered will include the degree of concentration of control in the various sections of the industry, the comparative economic strength of majors and independents, the chances for newcomers to enter the industry, and the relationships between independent producers, refiners and marketers and the major integrated companies. Statistics will be asked on the trends of employment and wage earnings, on the flow of new capital investment and the return on it, on the number and relative sizes of individual units in the business at various periods. Intercorporate relationships will be examined and the influence investment bankers and other investors may have over corporate policy.

Conservation programs probably will be studied from the viewpoint of their effect on prices and competition. The cracking patent pool is expected to receive its share of attention. Above all, information will be asked on trends of prices for crude oil, refinery gasoline prices and filling station prices, the factors that determine them, the relationship between them, the practice of "follow the leader" in price determination.

In short, the new procedure makes no change in the type of information T.N.E.C. desires; the change is only in the method of obtaining it. Government experts could work up the data themselves and present it in the form of reports or through examination of industry witnesses, but the experience of the committee has shown this to be not entirely satisfactory. The chief objection is that government lawyers and investigators are by training prosecutors, and they carry their prosecuting habits into an economic investigation; they like to prove a case rather than explore a problem. Also it has been discovered that any presentation by a government agency, no matter how carefully prepared, is apt to be an ex parte or one-sided affair and to be viewed in the nature of an indictment.

New Pipe Line Divorce Bill Put In By Borah

WASHINGTON, D. C., Apr. 18.—Senators William E. Borah of Idaho and Guy M. Gillette of Iowa today introduced a new bill to divorce oil companies from ownership of pipe lines. Its provisions are more stringent than the commodities clause of the Wheeler-Truman bill.

After July 1, 1940, the bill would make it unlawful for any common carrier by pipe line to transport petroleum or its products produced or refined under its authority or by a person or firm subject to its control, or by a firm to whose control it is subject, or by a firm with the same controlling stockholders. The prohibition would also extend to oil later acquired or under contract, option or understanding for subsequent acquisition. Criminal penalties are provided and the Department of Justice is directed to study corporate relationships of pipe lines and bring injunction suits for enforcement.

The bill was drafted in cooperation with Karl A. Crowley, of Fort Worth, who declared independents in the Southwest are organizing to fight for its enactment and that hearings before the T.N.E.C. will produce evidence to support the bill and to prosecute major companies for antitrust violations in their control of pipe lines.

All language which would result in forcing oil companies to divest themselves of ownership in pipe lines will be eliminated from the pending Wheeler-Truman omnibus transportation bill, it has been assured by Chairman Wheeler of the Senate committee on interstate commerce.

Chairman Wheeler gave this assurance publicly as a parade of oil industry witnesses prepared to appear before him on this question. He thought there should be further regulation of pipe lines, but the subject should be given independent consideration by Congress and should not be taken up in connection with a general transportation measure. As the commodities clause reads in his bill it would prevent a common or contract carrier from hauling goods owned by itself or by an interest controlling it.

Although refusing to hear any witnesses, the chairman did permit prospective witnesses to file statements already prepared on the subject of pipe-line divorcement. As a result, arguments against the proposal were filed by several persons, including Paul G. Blazer, president of Ashland Oil & Refining Co., Ashland, Ky.; M. R. Singleton of Valvoline Oil Co., and J. A. Neath, vice president of Humble Pipe Line Co. Paul E. Hadlick, National Oil Marketers Association, filed a statement for divorcement.

N.P.A. Forum Reveals Solid Opposition to Government Control of Oil

By J. P. O'Donnell

CLEVELAND, Ohio, Apr. 17.—Federal control of the oil industry is neither necessary nor desirable according to the consensus of oil men who participated in the panel discussion of the recently issued federal Energy Resources Committee report, the highlight of the thirty-sixth semiannual meeting of the National Petroleum Association. More than 300 oil men attended the sessions and heard timely discussions on aviation, the Mexican expropriations and the Federal Trade Commission by leaders in their respective fields.

The energy resources report was brought before the meeting by John W. Frey, associate director, Petroleum Conservation Division, Department of the Interior, and a member of the Energy Resources Committee. Mr. Frey made it clear that any views he expressed and not contained in the report were his own and that "I am unable to assure you that any one else holds the same point of view."

After discussing the report, he concluded: "The committee was very definitely against any recommendation that the federal Government should attempt to usurp any authority of the states, but its opinion was that minimum standards for the exploitation of petroleum to eliminate avoidable waste are necessary and that the federal Government and the oil-producing states, working toward the solution of a problem common and vital to all, should be able to accomplish the objective more effectively than each state pulling for itself. Even though the crew throws the coxswain overboard at the end of the race there is as much effort on the part of the crew to improve the coxswain as there is on his part to keep up the stroke."

Federal Opinion

Mr. Frey justified the federal Government's interest in the oil industry on these bases: (1) On public, Indian and naval reserves it is now in the production branch; (2) petroleum is vital in national defense; (3) transport is dependent on a continuous supply of reasonably priced petroleum products; (4) agriculture is organized to the use of petroleum power; (5) the economy and social conditions of producing states are immediately associated with the vicissitudes of the industry; (6) the fiscal and developmental programs of every state are such that a continuous use of petroleum products is imperative; (7) the United States is drawing upon its oil reserves more rapidly than the rest of the world.

The federal Government, Mr. Frey said, now is in position to steer a course for conservation only on public, Indian and naval lands, through informative and advisory work of the Bureau of Mines, Geological Survey and the Petroleum Conservation Division and by cooperation through the Connally law, the interstate oil compact and the Bureau of Mines estimates of demand.

In contrast to that position, Mr. Frey held the federal Government should be in a position that (1) It could cooperate with "the states and the industry to establish standards for production designed to prevent waste, to encourage conservation and to protect interstate and foreign commerce from the burden of oil produced in violation of such standards"; (2) there should be a rational policy concerning exports and imports with the aim of conserving resources and that those who propose restrictions of imports should prove that such action is necessary; (3) to prevent the destructive effects of bad marketing situations from vitiating the results of conservation, and (4) to prevent private operations from exerting destructive effects upon conservation practice on naval, public and Indian lands.

Coal Suspected

Col. Ernest O. Thompson, chairman of the Interstate Compact Commission, expressed the suspicion that the report is "flavored with the coal industry's desires" and wondered where the "irresistible demand for public ownership and control," cited in the report, would come from since the public is apparently satisfied with continually getting a better product at a cheaper price.

In defense of free enterprise against governmental control Colonel Thompson said: "Let's make a comparison. Gasoline was 29 cents in 1920. It now sells for 14½ cents not counting tax. Private enterprise and free competition did that and the gasoline you get today is a far superior product. On the side of government control and monopoly and operation you have the postal service. In 1920 it cost 2 cents to send a letter. Today it costs 3 cents and I do not see how the postage stamp in itself is superior in mileage qualities to the 1920 variety. Gasoline is down 50 per cent. Stamps are up 50 per cent."

The report's view that it is one of the unfortunate errors of our national policy in the past that public ownership of all subsurface mineral wealth was not declared and its claim of public ownership for reserves on tidal lands, were held contrary to the democratic principles of this country by Colonel Thompson. Our citizens were urged to take up and develop these lands, he said, and questioned, "Shall the Government now say to those citizens and their children 'You have done well, but this looks pretty good to the Government and we will just take it over'?"

In reply to the report's statement that in the event of war the country would need 800,000 bbls. of oil per day additional, Colonel Thompson declared: "The answer is that we are ready to produce it and can do it in Texas alone if need be. The oil industry is trained, seasoned, ready and equipped for all calls to duty. Is there any other industry so well prepared to aid in our country's defense?"

"Is this really and truly not just one more concentrated move toward a totalitarian state?" he asked.

"Are we not about to be plunged into complete government ownership, first by study and reports, then by just a little assistance to the states and then just a little insistence and then dictation, then regulation, then complete nationalization and government ownership and control?

"I want just as little federal interference with the industry as possible. I take hope from the statement made to me by the president at Hyde Park that he did not want federal control of oil. How far would I go? The answer is we have gone too far now. Certainly we should not go farther down the road to the fascist state."

Participating in the panel discussion on the energy resources report were:

Francis E. Heath, Sun Oil Co., Dallas, who discussed proration efforts in Texas, spoke of the improvements in production and improved yields in refining and declared, "The problem of conservation is being solved in a highly satisfactory manner."

W. T. Holliday, Standard Oil Co. of Ohio, who said: "It seems that the Government has merely a sympathetic interest but if it recommends that we have federal economic planning then we have a real issue. Is there a dilemma so great now that we should abandon free enterprise and go to the fascist method? Has the Resources Committee proved that more oil will be recovered by federal control?

"We can not blame past waste on lack of government planning. Only recently has scientific knowledge on conservation been available and the industry brought that, not economic planning. The report shows the best way to conserve is through technological improvement which is contained not in the dead hand of government but by scientific progress in the industry itself.

"There is little waste today and I doubt if enough to warrant or justify economic planning.

FEDERAL SPOKESMAN: *John W. Frey, associate director, Petroleum Conservation Division, Department of Interior*

Fellowship dinner of National Petroleum Association, Cleveland, Ohio

We are making rapid progress to greater recovery and better utilization."

B. L. Majewski, Deep Rock Oil Co., Chicago, who said "It is waste when we are selling products at 60 cents when crude costs $1. Could the United States correct this without price fixing? The committee seems to have been affected by the war scare. I do not believe the federal Government could do a better job than the states in this respect. The Government could aid conservation by allowing permissive agreements within the industry and by amending the antitrust laws."

H. T. Ashton, Socony-Vacuum Oil Co., St. Louis, who endorsed the views of Mr. Holliday and added that there are undoubtedly "grave dangers in economic planning."

E. C. Breene, producer, Oil City, Pa., who declared "I am no critic of the statement that the federal Government has an interest in oil and we invite rather than object to this interest. However, it is the character of this interest which gives us concern since not interest but regulation is suggested.

"We need your help more in the marketing end of the industry. It is not physical waste that is to be condemned but economic waste resulting from attempts to sell at less than cost. This policy forces back upon the producer a price that will not pay his costs."

Donald R. Richberg, counsel for American and British oil companies whose Mexican properties were expropriated a year ago, told the association that efforts are now being exerted toward the consummation of "a long-term contract under which the companies would be able to compensate themselves out of the efficient operation and further development of expropriated properties with coincident mutual assurances of satisfactory labor conditions and proper governmental revenues."

While expressing no optimism, Mr. Richberg said: "Mexico's economic situation did not warrant the assumption that either the government or the people could feel that the expropriation had produced beneficial results. The value of the peso had declined, cost of living had risen, large government revenues had disappeared, export sales of oil were limited and difficult, barter payments did not supply the need for inflowing capital and the flight of foreign capital stagnated trade. It might well be assumed that an opportunity to encourage the cooperation instead of the indifference or hostility of foreign capital would be welcome to the Mexican Government."

While it is universally recognized that any government has the right to expropriate private property for public purposes it is conditioned upon making adequate compensation, Mr. Richberg said. There is no prospect of Mexico making the oil expropriations legal for two reasons: Its foreign and internal debt, in default, already exceeds $1,400,000,000 and it therefore cannot make prompt payment for the properties and since it insists that all subsoil rights belong to the nation it cannot compensate for this major part of the value of the oil companies' properties.

Col. Edgar S. Gorrell, president of the Air Transport Association of America, said that this country has lost its leadership in aviation through neglect of research. He contrasted Langley field, America's lone research station with a staff of 450, with Germany's four stations with staffs of 300 to 1,200 each and Italy's Guidonia with 1,200.

Problems of small enterprises in the oil industry are much the same as those of the large companies, Paul G. Blazer, president of Ashland Oil & Refining Co., said. He cited agitation for divorcement of pipe lines, directed against the majors, as a possibility of serious concern for the small refiner operating in stripper areas.

He directed most of his criticism against the big companies who seek to become larger despite the fact that the earnings on their investment are, proportionately, less than smaller competitors. "I believe it is generally recognized," he said, "that the principal need for a code of fair marketing practices is to curb the marketing practices of the larger companies. They are the ones that are taking the lead in the loaning of expensive equipment, setting new dealers up in business and, frequently, are the worst offenders in giving secret prices and rebates."

In speaking on the province of the Federal Trade Commission in the field of business practices, Robert E. Freer, chairman of the commission, declared: "If specific restraints continue to be exempted from the antitrust laws or, if the trend away from competition is long continued, it appears inevitable that government will be required to participate more and more directly in the managerial functions of business. The removal of competition as a factor in our economic machine constitutes an irresistible invitation to the Government to participate.

"Business statesmanship is the need of the hour. Unless business statesmen in good faith endeavor to preserve the competitive system it seems doubtful that political statesmen can do so. Political democracy as we have known it can survive only in the indigenous soil of that competitive system of economic democracy in which it was evolved and nurtured.

"Since you in business will have a hand in helping shape the future legislative policy of what should be done about both public and private controls of industry, I want to conclude by leaving you this proposition: Assuming that only two courses are open, either the maintenance of fair competition or, in the absence of competition, government regulation of industry to insure fair treatment of the general public, which course is the most compatible with democratic institutions and least likely to result in paternalistic or authoritarian government?"

The industry was urged to pay more attention to statistics by C. L. Suhr, president of the association, who said, "Figures on crude runs and refinery inventories can furnish the basis for sound economic operations. We have had in the past too many peaks and valleys and this has been harmful not only to our own business but to many of our independent jobber customers upon whom our industry has relied and must rely for the major share of its trade.

"Our member companies have on too many occasions jeopardized the welfare of producers, refiners and their employes by ignoring the plain indications of our statistics. Our products are highly seasonal and that fact is ignored frequently. I do not wish to urge any particular course of action. I think, however, I am within my rights in urging our members to study our statistics in the light of all facts available to them and then take such action as intelligent study, not mere ambition, indicates."

W. W. Gary, M. W. Kellogg Co., spoke on new catalytic processes at the department of manufacture meeting. Questions the refiner should answer before adopting such processes are, he said, how well can it be applied, is it economical to use, what is its cost, what would be the effect on the product, can I continue to compete without it. He said synthetic catalysts are preferred to natural catalysts because they can be revivified oftener and provide better products and that continuous operation is to be preferred since it is more flexible.

Much of his discussion was devoted to the relative merits of catalytic cracking and reforming. The latter is particularly desirable for the small refiner especially if his straightrun gasoline is of low octane rating because it will provide 20 per cent more by volume of the same octane value and can readily provide octane values of 90 and above, he said.

John F. McFarland, Sun Oil Co., discussed the complexities involved by the commission agent in his talk on administrative provisions of the state social security act before the department of taxation. Transportation of petroleum products in barrels, drums or cases was discussed by John B. Keeler, chairman, legislative committee, National Industrial Traffic League, before the department of traffic and transportation.

LOS ANGELES A.P.I.

(Continued from Page 71)

California and some of the testers in use in the Mid-Continent. An attempt has been made to classify these tools according to the direction of motion required to open and close the retaining valves. The customary circulating valve is explained briefly along with the use and the precautions necessary to successful testing when this valve is used. The length of strainer pipe on the bottom of the tool is discussed, and points for and against the long strainers are considered. Some consideration is also given to the material from which these strainers are made, and to the safety precautions suggested with long strainers. The various types of commercial packers and their improvements are mentioned. The use of the rotary jar as an adjunct to testing is touched upon briefly. The locking type of equalizing valve, its uses and advantages, and the uses and advantages of the depth pressure recorder are discussed. An attempt is made to classify depth pressure recorders as to the actuating element. Notes and precautions applicable to the string of testing tools, surface equipment, and preparation are offered.

ECONOMICS OF GRAVEL PACKING IN CALIFORNIA

By William A. Clark
Texas Co. (California)

Gravel packing of oil wells has progressed out of the purely theoretical stage. From accumulated performance data its field of application and the more tangible economics of its use can now be stated with reasonable accuracy. Actual comparative drilling and production costs of gravel packed versus conventionally completed well are here presented.

ECONOMICS OF DEEP DRILLING IN THE SAN JOAQUIN VALLEY

By John F. Dodge, E.M.
Professor of Petroleum Engineering,
University of Southern California

Attention is called to the necessity of operators considering the economic advisability of the deep drilling in which they are now engaged in the San Joaquin Valley under present conditions of overproduction, weakened price structure, and curtailment. The financial outcome of a typical 13,000-foot well is estimated and the conclusion drawn that only under exceptionally favorable conditions will the necessary capital investment be returned while present oil prices and curtailed rates of production are in force. Recommendations are made with reference to deferment of drilling and drilling obligations which should be undertaken in new commitments.

HORIZONTAL DRILLING

(Continued from Page 69)

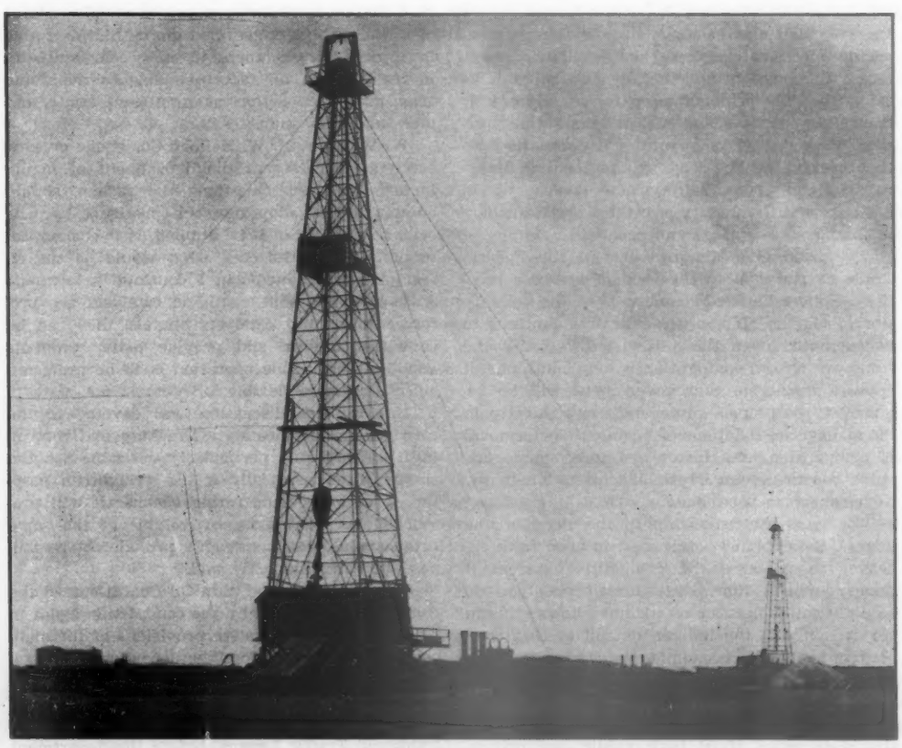
it is only now being connected up while the wash water is being pulled from the sand. We do know that the next wells will be more productive because each will have 2,000 feet of pay exposed—in the bottom of the sand.

The real development of the method will occur from shafts of small diameter sunk through the sand and enlarged and walled with concrete at the bottom. From this circular chamber, 20 feet in diameter, horizontal wells will be drilled out into the sand 3,000 to 3,500 feet, or to property lines. Sixteen of these wells will expose some 50,000 linear feet of sand—something heretofore unheard of in one location. Strange to say, drilling wells from a shaft bottom is expected to be at the rate of around 200 feet a day and, believe it or not, they should cost about half as much per foot as wells drilled from an outcrop. Such a development will cover 600 to 800 acres and will cost about $400 per acre, if the sand is no more than 400 feet deep.

Once the wells have been drilled, every other well will receive pressure, and any sort of repressuring or water flooding may be employed. One major company advocates the use of live steam. At any rate, since almost no equipment will be used, and fluid will be lifted for 1 cent a barrel, it is believed that Pennsylvania Grade oil can be produced at almost nominal cost.

In operating wells drilled radially from a shaft bottom it is necessary to compensate for the increasing distance between wells, but this is a simple matter. Again, believe it or not, the method enables us to drill parallel wells from the shaft bottom, alternating pressure and producing wells, to cover a square or rectangular lease. The method also permits deflecting vertical wells to horizontal, then extending these to 1,000 or 2,000 feet. This is not recommended, since the wells would not be self-draining. Where the sand is 2,000 feet or more in depth, drilling would best be from a tunnel in the rock below the sand, the holes being curved upward, then out, to parallel the sand, then extended 2,500 to 3,500 feet on each side of the tunnel. So from a single tunnel we would operate a property more than a mile wide, with alternating pressure and producing wells.

So many new methods, processes and tools are involved in this development that the Patent Office is requiring divisions in the applications that probably will reach 30 in number. The primary engineering difficulties of applying the method seem to have been solved to a practical point, but in time improvements will be made as rapidly as they have been made in drilling and operating properties by vertical wells. As a conservation measure it should make production profitable, and save a large percentage of residual oil, even in fields that have been subjected to all known secondary surface methods of recovery—and then abandoned, with from 60 to 80 per cent of the original oil still in the sand.



La Rosa field, Refugio County

Obituaries

IRA G. YATES, 79, on whose ranch in Pecos County, West Texas, the discovery well of the Yates field was drilled October 26, 1926, died at Austin April 12. He had been a peanut digger, and a mule trader before he became a ranchman. His father had been a ranchman in Missouri and his mother a native of Hopkins County, Texas, where he was born.

COL. ROBERT DAVID GORDON, 53, pioneer oil operator in West Texas fields, died April 17 at Fort Worth. He was born in Aldenburg, Germany, of Scotch parents, came to this country when six. He was one of the early operators around Ranger and the Eastland pool. Later he acquired interests in East Texas.

JAMES G. SUTTON, 68, of Vinton, La., a pioneer oil man of Southwest Louisiana, died last week. He was president of J. C. Sutton Oil Co., and Sutton-Zwolle Oil Co. Mr. Sutton moved to Louisiana from North Carolina in 1900.

JOHN ALVIN YOUNG, 71, former vice president of Island Oil Co., died April 11 at his winter home in Fort Myers, Fla. He directed construction of the first overland pipe line from the main land to a dock a mile offshore at Tampico, Mexico. At other times in his business career he occupied executive positions with Tide Water Oil Co. and Columbia Gas & Electric Co.

J. F. SHIPLEY, Newhampton, Mo., a former oil man from West Texas who was instrumental in the developing of several major oil pools in southern Ward County, Texas, died April 11 in Newhampton.

WALTER H. DICKIE, 53, traffic manager of Imperial Oil, Ltd., died in Toronto April 13. He was a native of New England and after several years' experience in the traffic department of Standard Oil Co. in New York moved to Sarnia, Ontario, in 1912 as assistant manager of the Imperial Oil traffic department. In 1930 he succeeded the late C. H. Lown as traffic manager. He was president of the Canadian Industrial Traffic League in 1923 and of the Toronto Transportation Club in 1933.

Texas Operators Oppose Increase in State Total

By D. H. STORMONT

AUSTIN, Tex., Apr. 17.—A majority of Texas operators attending the statewide proration hearing here today expressed themselves as wanting the commission to issue at least a 60-day order, covering May and June, and keeping production at all times within the Bureau of Mines estimated demand figure. This was indicated when Charles F. Roeser of Fort Worth asked attending producers to signify their preference for such a policy by rising.

In addition to this recommendation, several leaders came out strongly in favor of a long-range policy of issuing proration orders. Comparatively few operators asked for increased allowables, most expressing satisfaction that production be continued along present levels, so that as a result hearing proceeded along more harmonious lines than had been anticipated. An unusually large attendance was present due to the recent turmoil created by the drastic cuts and subsequent revisions contained in three April orders.

As the meeting opened it appeared an open fight might develop among various fields and sections of the state. Operators and representatives of North and East Texas made threats of court injunctions and felt they were being discriminated against in obtaining their fair share of market demand. The meeting, however, proceeded to change in spirit following a plea for cooperation by Charles I. Francis, Houston attorney representing Union Oil Producing Co.

Francis' Suggestion

He asked that the various districts cease fighting among themselves if they wished to stop threats of federal control. Pointing out that some operators were "running down" other fields and complaining of the higher allowables other fields were getting, he stated operators in one part of the state usually were not familiar with all the problems of other sections, thus differences in allowable might easily be justified. He suggested that "we should present the merits of our own fields and not try to ride to an increased allowable on the demerits of another." He suggested to the commission that it fix a certain well unit and not grant any exceptions unless it was impossible for the smaller tract holders to form a unit, when an affidavit should be presented; that it give greater weight to acreage in proration formulas, increasing the allowable to 75 per cent (instead of 50) on acreage and 25 per cent on ability of the well to produce, and that it promote gas conservation through repressuring.

Col. E. O. Thompson came out strongly in favor of the commission issuing orders to cover periods of two or three months and that the Bureau of Mines figures be used as a guide in setting monthly top allowables. "I have long been convinced," he stated, "that we should have 60 to 90-day orders. The one we issued after December 12 hearing proved to be a very acceptable order generally." He explained:

"It is my thought that we should have one order for 90 days covering January, February and March; two-month orders during April and May, June and July, and August and September; then a three-month order for October, November and December. This will give stability to your work. We should keep our allowables always within market demand as estimated by the Bureau of Mines. We should set our state allowables low enough below market demand that new wells coming in later in the month will not cause the top allowable to exceed the total set by the end of the month."

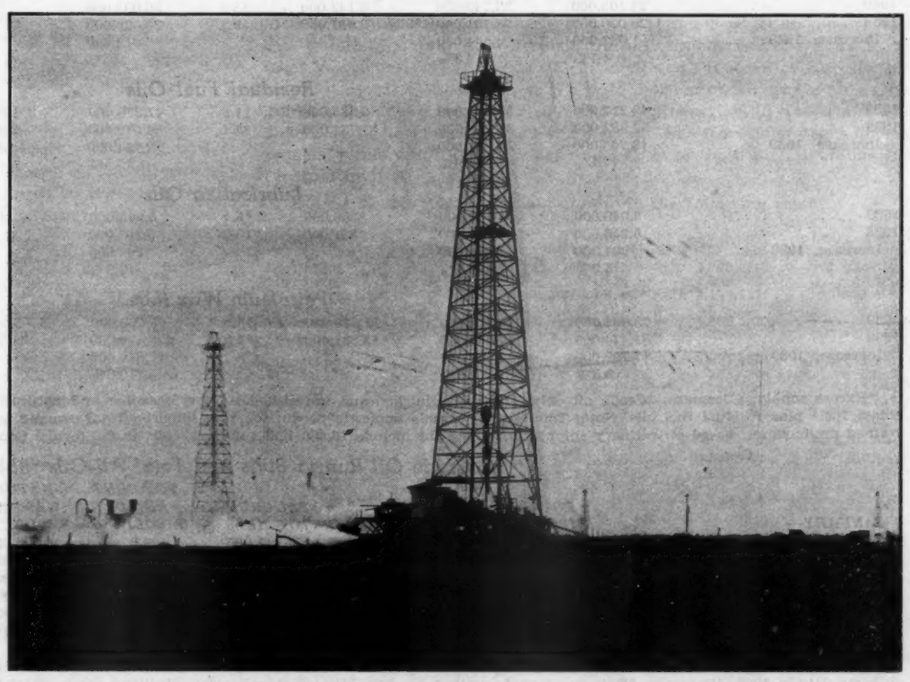
He then pointed to the high drilling rate being maintained and asked operators to look into the marketability of oil from proposed wells before they are drilled; "The more wells we drill, the lower will be the per well allowable. Shortly we will have so many wells that to give to each well the bare marginal allowable will take up the entire market demand."

Others advocating long-range proration orders included R. E. Hardwicke, Fort Worth attorney; Hines Baker of Humble, and Mr. Roeser. The latter in summing up asked that new orders be signed only after consultation of all three members of the commission and not just two. Mr. Hardwicke suggested a 60-day order be issued, during which period commission engineers would take data from every pool in the state with a view of arriving at a formula for allocation of market demand among various fields. He proposed three factors be used in drawing up the formula: Marginal wells, maximum rate at which a field should be produced and reserves.

Hearing April 20

Comparatively little testimony regarding technical data on fields that the commission asked operators to be prepared to give, was heard. The commission, however, continued the hearing to April 20 on several Gulf Coast fields at which time operators will present technical data in their plea for restoration of recent allowable cuts. Data pertaining to most of the fields involved in the recent allowable cuts were filed with the commission to be considered in the issuance of May orders.

Request for higher allowables in the Saxet field of the Gulf Coast was heard and Cosden Petroleum Corp. asked that Iatan-East Howard, Snyder and Howard-Glasscock fields be given a total increased production of 50,000 bbls. over next month or so to care for the present crude shortage at its Big Spring plant. Sulphur Bluff and Talco operators telegraphed a request that five-day production be restored. Regarding Saxet, Frio, Maston, Dixon, representing Southern Minerals Corp. of Corpus Christi, pointed out how operators in Corpus Christi area had developed a foreign market for their high-gravity crude at the expense of other foreign fields, and that if the allowable cut was not restored this market would be lost back to foreign countries.



Clara Driscoll field, Nueces County, Southwest Texas

Motor Fuel Demand Far Exceeds Predictions

The daily average production of crude oil, the Bureau of Mines reports, showed a moderate increase in February, when it was 3,338,400 bbls.. compared with 3,306,100 bbls. in January and 3,380,800 bbls. in February, 1938.

The principal changes in the state production figures in February, 1939, were in Oklahoma, Illinois, and Texas. In Oklahoma, daily average production, after hovering just below 450,000 bbls. for some months, increased 473,800 bbls. in February. Illinois' production continued to set a new record each month, that for February was 162,200 bbls. daily, compared with 143,400 bbls. in January. The trend of production in most districts of Texas turned slightly downward in February, the state's average being 1,298,300 bbls., against 1,313,800 bbls. in January.

The gain in production and a material decline in crude runs to stills were reflected in crude oil stocks, which increased slightly more than a million barrels in February after a decline in January. Stocks of all oils stayed virtually constant in February in contrast to a year ago when 7,300,000 bbls. were added.

Refined products: The yield of gasoline in February was 45.0 per cent, compared with 44.8 per cent in January and only 42.8 per cent in February, 1938. The yield of gas oil and distillate fuel oil was also higher than a year ago, but the residual fuel-oil yield in February declined to 24.5, the lowest point reached in several months.

The indicated domestic demand for motor fuel continued to exceed the most optimistic predictions, the February figure of 34,595,000 bbls. being 9 per cent higher than a year ago. On the other hand, exports of 2,909,000 bbls. for this February were more than 1,000,000 bbls. below the corresponding figure of a year ago. Because of the unexpected gain in demand the gasoline stock situation continued to improve over a year ago.

United States Supply and Demand—Crude Oil (Bbls.)

February, 1939

2 MONTHS	TOTAL SUPPLY	TOTAL DEMAND	EXCESS DEMAND	EXCESS PCT.	DOMESTIC POODUCTION	IMPORTS	INDICATED DOMESTIC DEMAND‡	EXPORTS	STOCKS REFINABLE CRUDE FEB. 28
1939	199,431,000	199,682,000	251,000	0.1	195,965,000	3,466,000	190,395,000	9,287,000	‖273,416,000
Daily average	3,380,000	3,384,000	.....	....	3,321,000	59,000	3,227,000	157,000	.....
1938	204,647,000	202,331,000	*2,316,000	*1.1	200,669,000	3,978,000	191,050,000	11,281,000	306,349,000
Daily average	3,468,000	3,430,000	.....	....	3,401,000	67,000	3,240,000	191,000	.....
Increase, 1939	†5,216,000	†2,649,000	.....	....	†4,704,000	†512,000	†655,000	†1,994,000	†32,933,000
	†2.5%	†1.6%	.....	....	†2.3%	†13.0%	†0.5%	†17.7%	†10.7%

Supply and Demand—Refinery Products—Motor Fuels (Bbls.)

2 MONTHS	TOTAL SUPPLY	TOTAL DEMAND	EXCESS DEMAND	EXCESS PCT.	DOMESTIC PRODUCTION	IMPORTS	DOMESTIC DEMAND	EXPORTS	STOCKS FEB. 28§
1939	92,529,000	78,909,000	*13,620,000	*17.2	92,529,000	.....	72,362,000	6,547,000	84,399,000
Daily average	1,568,000	1,337,000	.....	....	1,568,000	.....	1,226,000	111,000	1,431,000
1938	89,443,000	74,058,000	*15,385,000	*20.8	89,443,000	.....	67,037,000	7,021,000	90,035,000
Daily average	1,516,000	1,255,000	.....	....	1,516,000	.....	1,136,000	119,000	1,526,000
Increase, 1939	3,086,000	4,851,000	.....	....	3,086,000	.....	5,325,000	†474,000	†5,636,000
	3.4%	6.5%	.....	....	3.4%	.....	7.9%	†6.7%	†6.3%
Kerosene									
1939	10,876,000	13,223,000	2,347,000	17.7	10,876,000	.....	11,881,000	1,342,000	5,452,000
1938	10,805,000	11,902,000	1,097,000	9.2	10,805,000	.....	10,377,000	1,525,000	5,986,000
Increase, 1939	71,000	1,321,000	.....	....	71,000	.....	1,504,000	†183,000	†534,000
	0.7%	11.1%	.....	....	0.7%	.....	14.5%	†12.0%	†9.0%
Gas Oil and Residual Fuel Oil									
1939	76,320,000	89,047,000	12,727,000	14.3	74,208,000	2,112,000	82,937,000	6,110,000	114,325,000
1938	79,002,000	79,952,000	950,000	1.2	76,090,000	2,912,000	73,764,000	6,188,000	105,638,000
Increase, 1939	†2,682,000	9,095,000	.....	....	†1,882,000	†800,000	9,173,000	†78,000	8,687,000
	†3.4%	11.4%	.....	....	†2.4%	†27.4%	1.2%	†1.2%	8.2%
Gas Oil and Distillate Fuels									
1939	27,103,000	33,245,000	6,142,000	18.5	26,932,000	171,000	29,417,000	3,828,000	21,731,000
1938	26,020,000	28,701,000	2,681,000	9.3	26,020,000	.....	24,293,000	4,408,000	19,885,000
Increase, 1939	1,083,000	4,544,000	.....	....	912,000	.....	5,124,000	†580,000	1,846,000
	4.1%	18.3%	.....	....	3.5%	.....	21.1%	†13.1%	9.3%
Residual Fuel Oils									
1939	49,217,000	55,802,000	6,585,000	11.8	47,276,000	1,941,000	53,520,000	2,282,000	92,594,000
1938	52,982,000	51,251,000	*1,731,000	*3.4	50,070,000	2,912,000	49,471,000	1,780,000	85,753,000
Increase, 1939	†3,765,000	4,551,000	.....	....	†2,794,000	†971,000	4,049,000	502,000	6,841,000
	†7.1%	8.9%	.....	...	†5.5%	†33.3%	8.2%	28.2%	8.0%
Lubricating Oils									
1939	5,049,000	4,793,000	*256,000	*5.4	5,049,000	.....	3,262,000	1,531,000	7,951,000
1938	5,253,000	4,402,000	*851,000	*19.3	5,253,000	.....	2,782,000	1,620,000	8,363,000
Increase, 1939	†204,000	391,000	.....	....	†204,000	.....	480,000	†89,000	†412,000
	†3.9%	9.0%	.....	...	†3.9%	.....	17.3%	†5.5%	†5.0%
Petroleum Wax (Lbs.)									
1939	73,682,000	85,311,000	11,629,000	13.6	68,600,000	5,082,000	47,808,000	37,503,000	117,711,000
1938	81,474,000	77,643,000	*3,831,000	*4.9	76,440,000	5,034,000	55,278,000	22,365,000	148,823,000
Increase, 1939	†7,792,000	7,668,000	.....	....	†7,840,000	48,000	†7,470,000	15,138,000	†31,112,000
	†9.5%	9.9%	.....	....	†10.3%	0.9%	†13.5%	7.0%	†20.9%

*Excess supply. †Decrease. ‡Crude oil only. §Includes finished and unfinished refinery gasoline and natural gasolines. ‖Gas oil and fuel oil equals gas oil and distillate fuels plus residual fuel oils. Note: Total supply equals domestic production plus imports. Total demand equals domestic demand plus exports. Data on demand for refined products are based on refinery shipments. ‖Does not include 16,360 bbls. of heavy oils in California. Comparable figures for February 28, 1938, not available.

Crude Oil Run to Stills and Total All Oils (Bbls.)

JANUARY—	TOTAL IMPORTS§	TOTAL EXPORTS§	TOTAL CRUDE TO STILLS	PER CENT YIELD GASOLINE‡	NATURAL GASOLINE PRODUCTION	TOTAL SUPPLY ALL OILS*	TOTAL DEMAND ALL OILS*	STOCKS ALL OILS FEB. 28*
1939	6,944,000	25,116,000	187,411,000	44.9	4,708,000	211,275,000	211,504,000	554,241,000
Daily average	118,000	426,000	3,176,000	....	80,000	3,581,000	3,585,000	.....
1939	7,779,000	27,874,000	186,079,000	43.4	5,017,000	216,952,000	198,359,000	582,579,000
Daily average	132,000	472,000	3,154,000	....	85,000	3,677,000	3,362,000	.....
Increase, 1939	†835,000	†2,758,000	1,332,000	....	†309,000	†5,677,000	13,145,000	†28,338,000
	†10.7%	†9.8%	0.7%	....	†6.0%	†2.6%	6.6%	†5.0%

*Total all oils includes crude and refined products, natural gasoline and benzol. Stocks February 28, 1939, represented 155 days' supply which compared to 173 days' on same date in 1938. †Decrease. ‡Does not include natural gasoline blended at refineries. §Includes crude oil and refinery products. In case of imports includes receipts in bond and for domestic use. All data based on Bureau of Mines reports.

INTERNATIONAL

Venezuelan Natural Gas Development Proceeding Rapidly

Development of a natural gas supply for domestic and industrial utility in Maracaibo, Venezuela, is reported proceeding at a rate presaging completion during the middle or latter part of this year. Development of the gas production is in the hands of a group of companies of Royal Dutch-Shell parentage or affiliation. The companies include Colon Development Co., Ltd., Venezuelan Oil Concessions, Ltd., and Caribbean Petroleum Co.

In settlement of differences between the companies and the government that had arisen in connection with the exploitation of certain concessions in the state of Zulia the group agreed to exploit natural gas areas centering approximately 30 kilometers west of Lake Maracaibo. Limited information is available as to just how many wells have been drilled up to the present, but the American vice consul at Maracaibo reports that "a number of wells have been completed" and that a more extensive area is being covered by drilling operations.

Through the Bureau of Foreign and Domestic Commerce it is reported that a gasometer or central distribution station has already been constructed in the outskirts of Maracaibo and work is being carried forward in the laying of the gas mains. The actual construction work of laying the lines is being done by an American company and a large part of this work has been completed, with the exception of making the individual connections. "It is anticipated," reports the vice consul, "that the principal use for gas in Maracaibo will be for domestic cooking purposes, although a few industrial users of fuel have evidenced some interest in the project. At the present time the vast majority of employes and laborers in the employ of the oil companies at such places as Cabimas, Lagunillas and other centers of production use natural gas for domestic purposes in their homes and it is used extensively for industrial purposes by the petroleum companies. In Maracaibo a number of homes used compressed natural gas which is sold in steel cylinders by one of the companies; however, the use of this is confined principally to the Americans and other foreigners residing in the camps which the companies have established in Maracaibo."

Exploration Grant For Five Years to Mozambique Co.

The Mozambique Oil Co. (Companhia de Petroleos de Mocambique, Limitada) has been given a five-year exclusive concession to carry on petroleum exploration in a specified territory of Mozambique. The grant was made by the Portuguese Government and is subject to renewal for a similar period on showing by the company that at least 50,000 pounds has been spent in salaries and on materials for exploratory purposes in the primary period. The company, of which the headquarters must be on Portuguese territory, will start with a capital of at least 100,000 pounds. The president, as well as two directors, must be Portuguese. A government delegate appointed to the board will have the right to veto any measures which the authorities may find objectionable.

Plan for Production Of Oil From Coal In Australia

A report from Sydney, Australia, says a plan has been submitted to the Victorian Ministry, through the Victorian agent general in London, for the establishment of an industry, at a capital cost of about $20,000,000, to extract motor spirits and by-products from brown coal by a synthetic process. There are enormous deposits of brown coal at Yallourn, Victoria.

The German company (Ruhrchemie Aktiengesellechaft, with headquartes at Oberhausen-Holten), which submitted the plan, estimated the annual operating costs to produce approximately 60,000 tons of motor spirits would be about $5,000,000, and, making allowance for the sale of by-products, motor spirit could be produced at 148 reichsmarks a ton, which is equivalent to 1s. 3¼d. (30 cents) a gallon on the basis of 250 gallons to the ton. The agent general, however, making his estimates on the basis of 300 gallons to the ton, and an exchange rate of 9.6 reichsmarks to the Australian pound ($5), compared with the present rate of 9.3, calculated the cost at 1s. (24 cents) a gallon.

The objective of the plan is stated as the annual production of 60,000 tons (15,000,000 gallons) of motor benzine, 2,500 tons of liquid gas, and 14,000 tons of distilled tar.

The process suggested for Yallourn is the synthetic process, which Prof. F. Martin, of the Oberhausen-Holten concern, considers preferable to hydrogenation, because the latter process was now using practically all tar and very little coal.

The report of the German company says that a very wide range of products can be prepared which are suitable for present-day requirements. These include motor spirit, Diesel oil, lubricating oil, solid paraffin of different melting points, alcohols, and sundry other hydrocarbons.

The covering report by the Victorian agent general states that about 7½ tons of Yallourn briquettes would be required to product a ton of petrol.

Five Completions, Nine Operations, In Barco Area

Colombian Petroleum Co. is pushing its development program on the Barco concession in Colombia at a steady rate anticipating completion of the South American Gulf Oil Co. pipe line to Covenas which is expected to be ready to move oil about July 1. Five new wells were completed during the past month and there are nine active operations most of which will be completed to the shallow producing horizon during the current month. Prospects are that the Barco concession will contain approximately 75 completed wells when the pipe line is completed. The five producers added in March ranged in depth from 435 to 1,455 feet and initial of each ranged from 860 to 2,050 bbls. per day.

Venezuelan Output Slightly Lower But Above Year Ago

Daily average yield of crude oil in Venezuela tapered off slightly in March compared to February but was more than 15,000 bbls. higher than the rate prevailing a year ago. Estimated production from all shipping fields in Venezuela during March totaled 15,421,015 bbls., a daily average of 497,453 bbls. In February, a short month, the daily average output was 523,783 bbls., but in March 1938, the rate was only 482,250 bbls. per day.

One of the outstanding changes in the March production picture was the decline of output by Venezuela Oil Concessions and the increase by Lago Petroleum Corp., subsidiaries of Shell and Standard of New Jersey, respectively. The production of 7,874,351 bbls. credited in March to Lagunillas includes Lago Petroleum Corp.'s production in the Tia Juana and La Rosa fields and Creole's share in all Lake Maracaibo districts, consequently this year's figure is not comparable to those for Lagunillas and La Rosa in 1938.

Details of the March estimate appear in the following table:

Field—	Mar. 1939	Mar. 1938	Daily average Mar. 1939
Lagunillas	*7,874,351	5,790,280	254,010
Tia Juana	1,959,205	1,998,708	63,200
Quiriquire	2,215,214	2,146,127	71,459
La Rosa	982,161	2,651,227	31,683
Mene Grande	922,389	1,166,486	29,755
Tarra	469,719	395,927	15,152
Bachaquero	285,444	.....	9,208
Cumarebo	226,005	221,144	7,291
Temblador	173,968	188,555	5,612
Pedernales	156,742	155,133	5,056
Concepcion	72,129	79,427	2,327
El Mene	52,080	63,488	1,680
La Paz	31,608	93,241	1,020
Total	15,421,015	14,949,743	497,453
Total February 1939	14,665,968	.....	.....
Daily average February 1939	523,783	.....	.....
Daily average March 1938	.....	482,250	.....

*Figure includes all Lago and Creole production in Lake Maracaibo basin.

Company—			
Lago Petroleum Corp.	5,118,476	4,460,846	165,112
Venezuela Oil Concessions	3,921,956	4,081,981	126,515
Standard of Venezuela	2,908,894	2,874,729	93,835
Mene Grande Oil Co.	1,971,000	1,851,000	63,581
Caribbean Petroleum Co.	922,389	1,166,486	29,755
Colon Development Co.	469,719	395,927	15,152
British Controlled	52,080	63,488	1,680
North Venezuela Petroleum Co.	56,501	55,286	1,823
Total	15,421,015	14,949,743	497,453

Refinery Expansion

Two Refinery Projects Pushed in Wisconsin

Wisconsin, which never has had an oil refinery, now is witnessing virtually a race between two refinery projects to reach the stage of realization. Both apparently are well advanced.

Trade reports are that A. J. Fiore, head of Fiore Coal & Oil Co. of Madison, will build a small but complete refinery at Summit, near Madison. On a request by him, proposed by Illinois Central Railroad, a favorable rate has been published and will become effective May 5 on crude oil from Centralia, Ill., and nearby points to Madison of 15 cents per hundred pounds, or at the rate of 46.62 cents a barrel. Although it has been reported southern Illinois crude some months ago moved as far west as Kansas City, no instance of such a long northern haul for the southern Illinois oil by tankcar is known. The Fiore company does an oil jobbing business in and around Madison.

The other Wisconsin plan is for Wisconsin Oil Refining Co. to build a refinery at or near Milwaukee, a proposal which has been pushed by D. E. Foster and associates, crude to reach the plant by water from Michigan and Illinois.

Cosden Building New Refinery Near Graham, North Texas

FORT WORTH, Tex.—Construction of a combination skimming plant and absorption-type natural gasoline plant on its Sewell lease, 4 miles east of Graham, Tex., has been started by Cosden Petroleum Corp. The new Young County plant will have a 2,500-bbl. crude capacity and 5,000,000-cu. ft. natural gas capacity. It is expected that the project will be completed about the middle of May. The company has two gas wells, four oil wells and a fifth well near completion on the Sewell block, which is comprised of 3,375 acres.

Construction of the new plant has been held up for the past several months by a suit of J. S. Cosden and his wife against the Cosden company and officials. In a decree entered here last Saturday morning before Federal Judge Wilson in the Federal District Court, the court permanently enjoined Mr. and Mrs. Cosden for further asserting claims of invalidity of certain agreements and conveyances between them and the Cosden Petroleum Corp., which had been made the basis of the suit.

Alterations Commenced At East Calgary Plant

CALGARY, Alberta.—Imperial Oil Refineries, Ltd., will commence work early in May on alterations to its East Calgary refinery, at a cost of approximately $1,750,000

Supply of High Octane Assured in Emergency

NEW YORK, Apr. 18.—Refining process developments by which an unlimited supply of 100-octane motor fuel may be produced in case of national emergency were reviewed by Dr. W. J. Sweeney, associate director of the Esso Laboratories of Standard Oil Development Co., before a joint meeting of the American section of the Society of Chemical Industry (British) and the American Chemical Society in New York. M. L. Haider, director of the production and engineering department of Standard Oil Co. of New Jersey, explained the technique of oil well drilling and operation. Most of the audience were chemists and generally unfamiliar with the fundamentals of production practice.

Hundred-octane motor fuel, once considered the "gold standard" of gasoline antiknock performance, recently has been made available in commercial quantities. It is particularly useful in maneuverability demanded of combat planes, in commercial aircraft for take-off and climb and for ocean flying where the fuel saving makes possible a heavier pay load.

The demand for higher octane motor fuel has brought about a series of refining developments, many of which have not yet run their course, Doctor Sweeney said. First comes polymerization of olefinic materials into liquid fuels as an economy measure following increased gas production resulting from severe cracking. This also served the purpose of preparing high-octane blending agents like isooctane. Such processes use a variety of catalysts, including supported phosphoric acid and liquid sulfuric acid.

A later development, said Doctor Sweeney, is alkylation wherein olefins are reacted with iso-paraffins to produce saturated "branchy" hydrocarbons of high octane number and good volatility.

Doctor Sweeney described isomerization as the process which changes normal butane into isobutane and dehydrogenation as a process for conversion of butane and propane into the corresponding olefins.

Attention was called to development of a number of chemical treating processes for stabilizing gasolines and heating oils. For the same purpose, antioxidants also have been produced in great numbers, while addition agents for lubricating oils to promote oiliness, improve viscosity index and for prevention of sludge and oxidation have been discovered and widely applied.

Doctor Sweeney referred in a general way to improved distillation equipment and product control and to the commercial application of hydrogenation in this country by which yields of 100 per cent motor fuel have been obtained from charging stock.

Regarding catalytic processes, Doctor Sweeney said developments have been extremely diverse. Thermal reforming of low-octane, heavy naphthas into modern

Pipe Line Activity

American-Michigan to Lay 30-Mile Natural Gas Line

MUSKEGON, Mich.—American-Michigan Pipe Line Co., affiliate of Michigan Consolidated Gas Co., is making a survey for a 30-mile pipe line to connect the natural gas field in Lincoln, Freeman, and Redding townships of Clare County with the Austin Township, Mecosta County, field supplying Greater Muskegon. The project, approved by the Public Utilities Commission, would assure Muskegon consumers of natural gas for several more years above the original 10 estimated on Austin Township wells, it was declared by officials.

Dean W. Flowers, Muskegon manager of Michigan Consolidated and vice president of American-Michigan Pipe Line Co., said the job, calling for a gathering system in Clare County and 4-inch or larger line from Clare to Mecosta County, would cost around $219,000. He said construction is not due to start until August. It is the biggest gas pipe line job projected in Michigan so far this year.

Mecosta County is now the only source of Muskegon gas, reaching here through a pipe line in use since 1934, but American-Michigan has acquired extensive holdings in the Freeman-Redding area and in Grant and Sheridan townships, Clare County, and Winfield Township, Montcalm County.

The pipe line company also moved last week to tap gas reserves in the new Kent County oil field, having filed a petition with the Public Utilities Commission to become a common purchaser of natural gas in Walker and Wyoming townships near Grand Rapids. Oil output of the two townships was 542 bbls. daily last month while gas reserves are yet problematical.

Tri-Lakes Pipe Line Co., subsidiary of Simrall of Bay City, principal purchaser of oil in Central Michigan, has completed a gathering system for rail-truck shipments out of the new Bangor pool of Van Buren County, leading oil-producing area of the state. The company has built a six-car addition to its loading rack at Bloomingdale, Van Buren County.

Root Petroleum Buys Gathering System

Standard Oil Co. of Louisiana is reported to have sold its gathering system connected to 55 leases with 825 bbls. daily production in the east El Dorado field, Union County, to Root Petroleum Co., at a reported price of $12,000 payable by the barrel as run. There has been some negotiation between Standard of Louisiana and Lion Oil Refining Co. for Lion to get the Standard Smackover gathering system, but is has been officially denied in Standard headquarters at Shreveport that any sale has been effected. Standard and Arkansas Fuel Oil Co. (Cities Service) have made an exchange of connections whereby the Standard gathering system in the old Haynesville field, Louisiana, tied into 83 leases with a daily yield of 2,000 bbls. is transferred to Arkansas Fuel, which in turn let Standard have a gathering system at Rodessa handling about 900 bbls. daily.

PIPE LINE COMMITTEE OIL-WORLD EXPOSITION

E. F. Seaman, Bethlehem Supply Corp.; Tom Wheatley, Wheatley Bros. Co.; E. G. Lenzner, general manager, Oil-World Exposition; J. A. Neath, Humble Pipe Line Co.; L. F. Scherer, Texas Pipe Line Co.; E. L. Rolfs, Crutcher-Rolfs Cummings, Inc.; S. L. Organ, Johns-Manville Sales Corp.; J. D. Brance, Brance-Krachy Co.; J. L. Speece, Gardner-Denver Co.

motor fuel has been extensively applied, the speaker said. Gas reversion is another refining development which has contributed to the quality of motor fuel. This process involves the simultaneous pyrolysis of normally rejected light gases and distillates, higher boiling than gasoline, with attendant increases in yield and octane number.

One of the points stressed by Mr. Haider in his discussion of drilling and production practices was the chemical control of circulating fluids in rotary operation. He mentioned the various types of weighting materials used, the chemical plugging of subsurface zones to shut off undesired flows of fluid, the use of hydrochloric acid to increase productivity in limestone or lime bearing formations and the corrosion problems in the field.

Construction Rushed At Falcon Plant

Falcon Refining Co. of Great Bend, Kans., is rushing completion of steel work for a bubble tower of 2,000 bbls. capacity in a remodeling of its Great Bend plant. A Dubbs cracking unit is being designed by the Universal Oil Products Co. of Chicago for installation during May; together they will increase the total refining capacity of the plant to 4,000 bbls. daily.

Bay Petroleum Corp. is erecting a new still house and furnace at its McPherson refinery.

New Refinery Proposed For Henderson, Ky.

OWENSBORO, Ky.—Ben Franklin, Kilgore, Tex., has announced that Southport Petroleum Co., Kilgore, is considering the construction of an oil refinery in Henderson, Ky. The proposed plant would be in the Henderson city limits near the Ohio River, with a capacity of 3,000 bbls. a day.

Natural Gas

Texas Gas Rate Decision May Be Precedent

AUSTIN, Tex.—Ernest O. Thompson, member of the Railroad Commission, said gas users of Texas won a great victory when the third circuit Court of Civil Appeals decided the commission order reducing the gate rate of the Lone Star Gas Co. from 40 to 32 cents per 1,000 cu. ft. was reasonable and valid. He admitted the company might appeal, but said the Supreme Court doubtless would affirm the lower court judgment.

"Thus," he said, "the cities and towns of Texas served by the Lone Star Gas Co. now have the door open to them to proceed with their rate reductions to gas users on the assumption backed up by this court decision that 32 cents per 1,000 cu. ft. is a fair and reasonable rate at the city gates."

Gas Purification Plant For Kanawha County

United Fuel Gas Co. of Charlestown, W. Va., has entered into an agreement with Girdler Corp., Louisville, Ky., for erection of a gas purification plant in Kanawha County, West Virginia. This plant, which has a capacity of 15 million cubic feet of gas per day, will remove H_2S from sour natural gas which will then be distributed for domestic and industrial use.

Construction of the plant will be carried out by J. F. Pritchard & Co. of Kansas City, Mo. The plant is expected to go into operation early this summer.

New Line to End Pipe Line Proration in K.M.A.

WICHITA FALLS, Tex.—End of pipe line proration for the K.M.A. pool of southern Wichita County was forecast when Sinclair Prairie Oil Co. completes its new line from the field on May 15. The line will be of 6-inch welded pipe 65 miles long to the Hensley station of the Sinclair Prairie, 6 miles southwest of Jacksboro, in Jack County.

Natural Gasoline

Rhodes Pool Gasoline Co. plant

Rhodes Pool Gasoline Plant Placed in Operation

Rhodes Pool Gasoline Co.'s new repressuring and natural gasoline plant in the Rhodes pool, 6 miles southeast of Bryson, North Texas, was placed in operation the first of this week. The plant, of 2,000,000 cu. ft. daily capacity, will take natural gas from 57 wells in the pool, extract its natural gasoline content by compression and return the residue to 12 key wells at 200 to 300 pounds pressure. The Rhodes pool company is made up of the following operators in the pool: Hanlon-Buchanan, Inc., Ohio Fuel Supply Co., Hammon & Herbert, and Hamilton & Hammond.

Convention Program Features Announced by N.G.A.A.

The technical session of the eighteenth annual convention of the Natural Gasoline Association of America, scheduled for May 3-5, at the Hotel Tulsa, Tulsa, will feature a broad discussion of polymerization processes and their application to natural gasoline operations. Announcement to this effect was made recently by B. R. Carney, Shell Oil Co., chairman of the convention program committee, in a discussion of the tentative program.

The application of the catalytic process will be presented by F. B. Mack, Shamrock Oil & Gas Co., Shamrock, Tex., while the thermal process discussion is to be a joint presentation of the Phillips Petroleum Co., Humble Oil & Refining Co. and the Kellogg Co. These papers will discuss the feasibility of broadening natural gasoline operations to include processes of this type, will deal with the economics of such installations and point out their limitations. This will be the first time that natural gasoline manufacturers have had an opportunity to hear a summary of these refining processes with direct reference to their own operations and the papers were requested because of widespread interest in the subject.

Another feature of the program is the presentation of a revised standard form of casinghead gas contract on which the association has been working for ever a year. James E. Allison, Hanlon-Buchanan, Inc., Tulsa, will present a paper covering the new form and explaining the revisions which were deemed necessary to bring it up to date and to make it more applicable to present and possible future operations. Gas-contract men of the entire industry have been invited to attend this session and to take active part in the open discussion of the new form. A special luncheon for these men has been planned for Thursday noon, May 4.

Other papers on the tentative program include a particularly timely discussion on "Blending Modern Motor Fuels," by W. B. Engelbrecht and H. M. Trimble, Phillips Petroleum Co., outlining the position of natural gasolines in this trend; "Safety in Natural Gasoline Operations," by A. A. Hardee, Skelly Oil Co.; "Possible Solution of the Outage Problem," by J. R. Jarvis, Lone Star Gasoline Co., Dallas; and "It's Our Business," an informal talk on public relations by Ray E. Miller, chairman of the Region 4, A.P.I. public relations committee.

The entire last day of the convention, Friday, May 5, is to be devoted to the annual "kinks" session which is a prize contest in which field and laboratory men compete with their own original ideas for the simplification or improvement of any operation in natural gasoline manufacture. Entries in the contest already received indicate that it will be the largest and most interesting session to date.

Nominations for the Hanlon award, presented each year for outstanding individual service or achievement in the natural gasoline industry, have been unusually heavy in this, the third year of its presentation. The award will be made on Thursday, May 4, following determination of the recipient from the nominations submitted by the award committee consisting of J. A. La Fortune, Warren Petroleum Corp., president of the association; William F. Lowe, secretary-treasurer, and R. E. Baker, Shell Oil Co., chairman of the technical committee. They will be assisted by an advisory committee from the board of directors.

Tide Water-Seaboard Let Gasoline Plant Contract

NEW YORK.—Tide Water Associated Oil Co. and Seaboard Oil Co. announced awarding of a contract for construction of a new gasoline plant to cost from $300,000 to $350,000 to Pritchard & Co., building contractors.

The plant is to be built in the Long Lake field, Anderson County, East Texas, and ground has already been cleared for the unit.

Pritchard & Co. will erect buildings and install machinery. The contract calls for a high-pressure refrigeration, extraction and recycling plant, with a capacity of 25,000,000 cu. ft. of gas and 25,000 gallons of gasoline per day. It is expected the unit will be completed within the next three months.

Expansion Program Started At Canadian Refinery

CALGARY, Alberta.—Gas & Oil Products, Ltd., is engaged in preliminary work in connection with installation of a new cracking unit for its refinery on the Mercury lease in South Turner Valley. Machine shops are being enlarged and foundations built while plans of the unit and necessary readjustments of the main plant, are completed. The Dubbs cracking unit is to be in operation by July 15, with a capacity between 500 and 1,000 bbls. a day. In addition, an Ethyl blending plant wil be erected. The new installations will enable the company to furnish all grades of petroleum products from tractor fuel to aviation gasoline.

Programs and Meetings

Kansas Chapters to Hold Joint Meeting at Lyons

The three chapters of the American Petroleum Institute in Kansas will hold a joint meeting in the city hall in Lyons, Kans., the evening of May 5. The three chapters in Kansas are known as the Wichita, McPherson, and Western Kansas chapters.

The chairmen of these chapters are L. H. Thawley, with Phillips Petroleum Co., in Wichita, chairman of the Wichita chapter; E. E. Newport, with Sinclair Prairie Oil Co., at McPherson, chairman of the McPherson chapter, and F. W. Shelton, with Phillips Petroleum Co., at Great Bend, chairman of the Western Kansas chapter.

E. F. Kindsvater, of Bartlesville, Okla., research engineer for Phillips Petroleum Co., will talk on "Corrosion of Oil Field Equipment." Mr. Kindsvater has spent many years in this line of work and is an authority on the subject. He will have a series of slides illustrating various corrosion problems he has encountered and offer suggestions for the prevention of some of these corrosion problems.

The chamber of commerce and city of Lyons will be host and have gone to great pains in securing outstanding professional entertainment.

Giant Safety Rally Planned By Panhandle Chapter

Once a year the Panhandle Chapter of the American Petroleum Institute designates one of its regular monthly meetings as "Safety Meeting Night." Last year over 1,000 attended the Safety Rally and this year the chapter is making arrangements to handle 1,800. The companies operating in the Panhandle are asked to designate Tuesday night, May 9, as company safety meeting and join in a giant safety rally.

G. M. Kintz, district engineer of the U. S. Department of the Interior, Bureau of Mines, will deliver a lecture and demonstration on "What Is Fire and What Causes an Explosion."

The meeting will be held at the new Pampa High School auditorium at 8 p.m.

The lecture and demonstration by Mr. Kintz explains what a fire really is—that wood, kerosene and other inflammable solids and liquids will not burn in that state. It demonstrates by actual fire on the stage that gasoline vapors will travel great distances, be ignited, and flash back to the source. With a pan of fire on the stage the different type of fire extinguishers are demonstrated by actual use, and explanation made of the proper precautions that should be taken with the use of certain types to avoid being overcome with the fumes.

By means of an explosion chamber an electric motor is sealed in an explosive mixture of gas and an actual explosion takes place, showing in detail what occurred at the New London school. The construction of the motor is then changed so that it becomes similar in design to a permissible motor as approved by the Bureau of Mines or an Underwriters Laboratories approved motor. This same motor is then placed in an explosive mixture of gas and operated without igniting the gas.

The hazards of stringing electric wires near inflammable vapors, gases, and oil wells, are shown by causing the wires to swing together in an explosive mixture of gas without igniting the gas, and the same spark is reproduced and it causes ignition. A heated electric filament is placed in an explosive mixture of gas without igniting the gas; it is allowed to cool, then reheated to a little higher temperature and ignition takes place.

Globes as used in unapproved and permissible flashlights are placed in an explosive mixture of gas, and the burning globe of the permissible light is then broken without setting off the gas; this is followed by breaking of the burning globe of an unapproved flashlight or lantern and this globe causes a violent explosion.

North Texas Geological Society Field Trip

The North Texas Geological Society is sponsoring a field trip in western Oklahoma and the Panhandle of Texas, Friday and Saturday, April 28 and 29. The party will meet at the Wilbarger Hotel in Vernon, Tex., at 8 p.m. Thursday, April 27 for a pretrip discussion. The object of the trip is to tie in the Permian of Oklahoma with the Pease River group of Texas.

Educational Oil Conference To Be Held in New Mexico

Hiram M. Dow has instigated the holding of an educational oil conference at the University of New Mexico in Albuquerque, N. M., on May 5 and 6. This is a two-day round table conference, to be held under the joint sponsorship of the University of New Mexico and the New Mexico Oil Conservation Commission, the members of which commission are the governor, the state land commissioner and the state geologist.

Col. E. O. Thompson, W. R. Boyd, Jr., and H. B. Fell have accepted invitations to speak. The program of formal papers follows:

New Mexico Stake in Oil, a local speaker.

Oil and Gas Development in New Mexico, a local speaker.

The Value of Orderly Development, a local speaker.

The Part That Oil Plays in the Maintenance of Government in New Mexico, a local speaker.

New Mexico's Conservation Achievements, a local speaker.

The National Oil Picture, Col. E. O. Thompson.

The Relation of New Mexico to the Nation, either Mr. Boyd or Mr. Fell.

It is planned to have 500 or 600 present—mostly representatives of institutions of higher learning in the state and the common schools. taxpayers, public officials and members who served in the legislature just closed.

Mr. Dow says: "New Mexico has stayed in line in fine shape, as I view it, and I am anxious that it remain in that position, and hence this start in an educational movement and as a build-up for a large attendance at the compact meeting in Santa Fe to be held this summer."

Canadian Gas Association Annual Meeting

The thirty-second annual convention of the Canadian Gas Association will be held at the Royal Connaught Hotel, Hamilton, Ontario, June 6-7. Secretary-Treasurer G. W. Allen announces that many outstanding gas men are preparing practical papers on subjects worthy of attention at this time.

CALENDAR

April

OIL-WORLD EXPOSITION, Houston, Tex., April 24-29.

May

PETROLEUM ELECTRICAL SUPPLY ASSOCIATION AND PETROLEUM INDUSTRY ELECTRICAL ASSOCIATION, Rice Hotel, Houston, Tex., May 2-4.

NATURAL GASOLINE ASSOCIATION OF AMERICA, Hotel Tulsa, Tulsa, Okla., May 3-4-5.

AMERICAN PETROLEUM INSTITUTE, Division of Production, Kansas chapters in joint meeting, Lyons, Kans., May 5.

AMERICAN PETROLEUM INSTITUTE, Panhandle chapter, Division of Production, safety rally, May 9.

NATURAL GAS SECTION, A.G.A., annual meeting, Tulsa, May 8-11.

AMERICAN PETROLEUM INSTITUTE, ninth midyear meeting, Roosevelt Hotel, New Orleans, La., May 15-18.

NATIONAL OIL SCOUTS ASSOCIATION, Houston, Tex. May 18-20.

NATIONAL ASSOCIATION OF PURCHASING AGENTS, annual convention (Oil Company Buyers' Group), Fairmont Hotel, San Francisco, Calif., May 21-25.

WORLD AUTOMOTIVE ENGINEERING CONGRESS, sponsored by S.A.E. for New York (May 22-26), Indianapolis (May 20), Detroit (May 31-June 2), San Francisco (June 6-8), May 22-June 8.

June

ILLINOIS-INDIANA PETROLEUM ASSOCIATION, seventh annual conference, Robinson, Ill., June 3.

PENNSYLVANIA GRADE CRUDE OIL ASSOCIATION, Hotel Hershey, Hershey, Pa., June 15-16.

THIRTEENTH INTERNATIONAL CONGRESS OF CARBIDE, ACETYLENE, OXYACETYLENE WELDING AND ALLIED INDUSTRIES, Munich, Germany, June 25-July 1.

AMERICAN SOCIETY FOR TESTING MATERIALS, forty-second annual meeting, Chalfonte Haddon Hall, Atlantic City, N. J. June 26-30.

August

MICHIGAN OIL AND GAS EXPOSITION, Mount Pleasant, Mich., Aug. 1-6.

September

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, New York. September 4-8.

OIL WORKERS INTERNATIONAL UNION, Hammond, Ind. September 5.

AMERICAN CHEMICAL SOCIETY, Detroit, Mich. September 9-13.

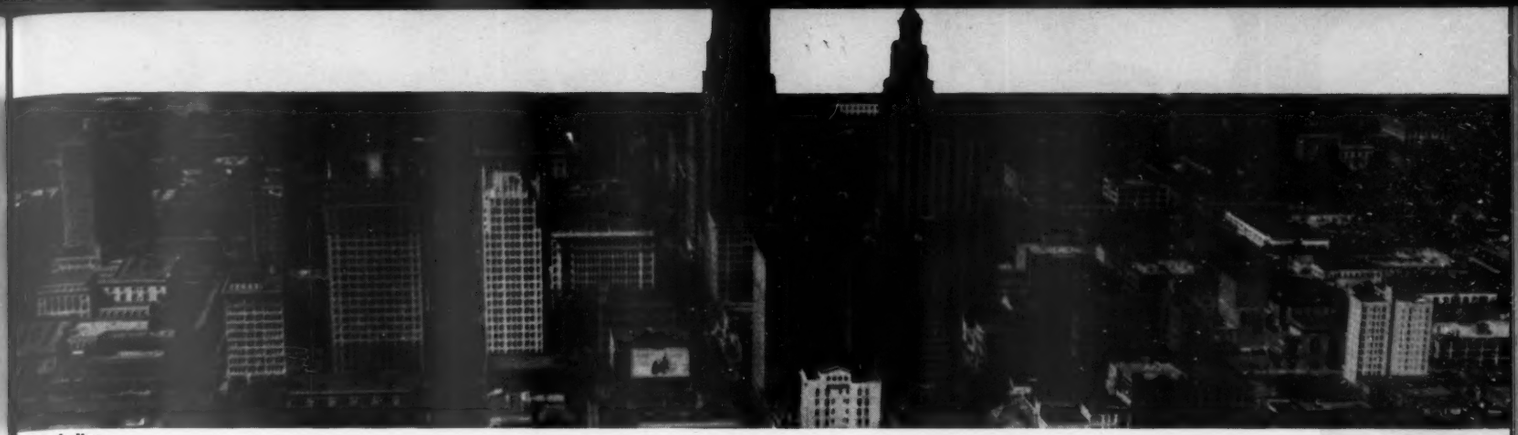
October

INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA, tenth annual meeting, Fort Worth, Tex.

NATIONAL SAFETY CONGRESS AND EXPOSITION, Chalfonte Haddon Hall, Atlantic City, N. J. October 16-20.

November

AMERICAN PETROLEUM INSTITUTE, twentieth annual meeting, Stevens Hotel, Chicago, November 13-17.



uston skyline

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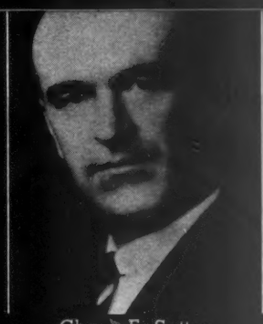

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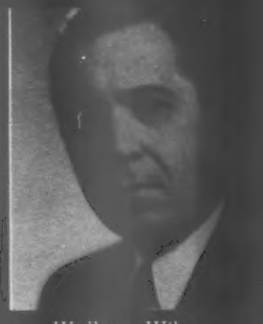

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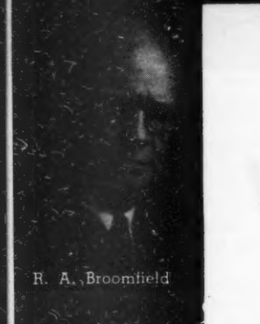

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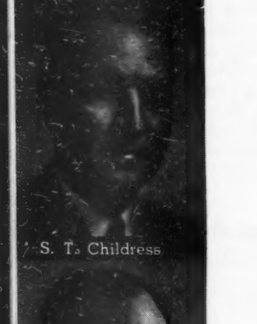

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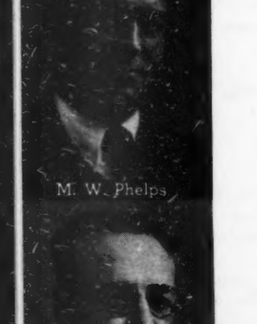

M. W. Phelps

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Oil-World Exposition Program

MONDAY, APRIL 24

Host for the Day

S. P. BROWN

Vice President, Hughes Tool Co.

Directors for the Day: J. C. Axelson, Frank Champion, H. J. Craig, H. R. Cullen, M. N. Dannenbaum, T. J. Donoghue, J. M. Kinabrew, D. T. McIver, J. W. Newton, J. R. Parten, Tom Pew, W. W. Plowden, Sid Richardson, F. H. Thrailkill, W. C. Trout, J A. Vickers.

12:30 p.m.: Luncheon of Oil-World Exposition Directors and Officials.

Houston Club

2:00 p.m.: Official Opening Ceremonies—Coliseum

EXPORT PROGRAM

2:30 p.m.: Oil Equipment Export Committee Meeting.

Convention Hall

Papers to be presented:

"Crating and Papers Necessary for Foreign Shipments"
"Proper Insurance on Foreign Shipments"
"General Trend of Drilling Equipment in Foreign Fields"
"Export Sales From the West Coast"
"Transportation Problems in Venezuela"
"Transportation Problems in Colombia"
"Foreign Exchange"
"Barter and Its Effect on Foreign Trade"
"Methods of Promoting Foreign Sales"
"Aviation and Its Place in the Oil Industry"
"Petroleum Development in Brazil"
"Petroleum Outlook in Rumania"
"The Far East"

7:30 p.m.: Oil Equipment Export Committee Meeting.

ENTERTAINMENT PROGRAM, General

Convention Hall

7:00 p.m.: Humble Glee Club—Balcony, Coliseum.

1:00 p.m. to 6:00 p.m.: Skeet Shooting, Robert J. Miller, supervising—Brae-Burn Skeet Club.

TUESDAY, APRIL 25

Host for the Day

F. S. CAROTHERS

Houston Branch Manager, Norvell-Wilder Supply Co.

Directors for the Day: Richard Bloss, A. I. Brainard, J. D. Brance, S. T. Childress, K. W. Davis, N. G. Guiberson, A. M. McCorkle, W. R. Martin, H. W. Millmine, M. E. Montrose, J. E. Moore, Fred F. Murray, G. L. Ratcliffe, Joe H. Russell, D. R. Snow, E. R. Turner.

REFINERY PROGRAM

Room "D" Balcony, Coliseum

10:00 a.m. "The Manufacture and Testing of Liquid-in-Glass Laboratory Thermometers"—R. M. Wilhelm, C. J. Tagliabue Mfg. Co.

"Trends and Economics in Testing of Asphaltic Materials"—Daniel Smith, Texas State Highway Department.

1:30 p.m.: "Requirements Governing Accuracy and Stability in the Manufacture of Laboratory Glassware"—J. J. Moran, Kimble Glass Co.

"Water Problems of the Oil Industry"—L. P. White, City of Houston.

"The Microscope and Its Application to the Petroleum Industry"—John T. Rooney, Spencer Lens Co.

"Motor Car Fuel Specifications, Trends and Economics"—F. T. Mechlin, State of Louisiana.

7:30 p.m.: "Manufacture and Packaging of Analytical Chemicals"—G. B. Hafer, J. T. Baker Chemical Co.

"The Manufacture of Laboratory Glassware"—Movie Film by Robert Fish, Corning Glass Works.

PIPE LINE PROGRAM

Room "C" Balcony, Coliseum

9:30 a.m. to 9:40 a.m.: Opening Remarks—H. M. Stevenson, Chairman, Humble Pipe Line Co.

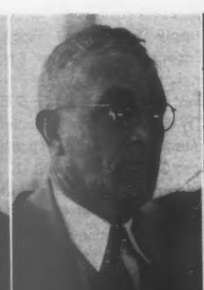
9:40 a.m. to 10:00 a.m.: "Maintenance of Portable Pipe Line Field Pumping Units"—N. G. Moore, Empire Pipe Line Co., Bartlesville, Okla.

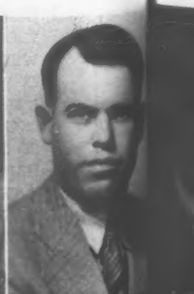
10:00 a.m. to 10:15 a.m.: Discussion.

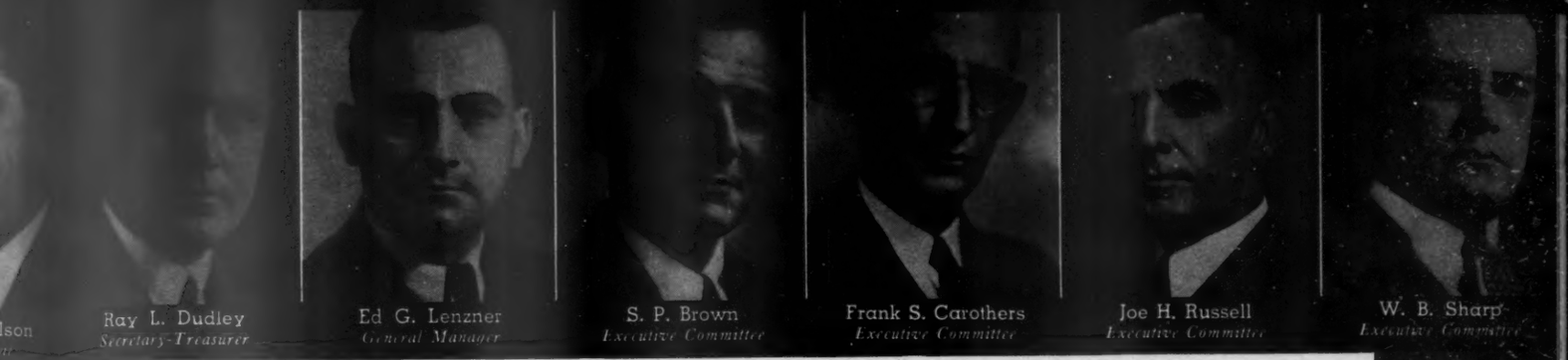
10:15 a.m. to 10:45 a.m.: "A Method of Arresting Pressure Surges in Discharge Piping of Reciprocating Pumps"—J. B. Harshman, Stanolind Pipe Line Co., Tulsa.

11:30 a.m to 11:45 a.m.: Discussion.

11:45 a.m.: Adjourn for Lunch.







Pipe Line Program Sponsored by: Mid-Continent Cathodic Protection Association, Walter F. Rogers, Chairman, Gulf Refining Co.

1:30 p.m. to 1:40 p.m.: "Purposes of Mid-Continent Cathodic Protection Association"—W. F. Rogers, Gulf Refining Co., Houston, Tex.

1:40 p.m. to 2:00 p.m.: "Method of Determining Whether Electrical Protection Should Be Applied to Pipe Line or Whether the Line Should Be Reconditioned"—D. B. Good, Texas Empire Pipe Line Co., Houston, Tex.

2:00 p.m. to 2:20 p.m.: Discussion.

2:20 p.m. to 2:40 p.m.: "Location and Installation of Ground Beds and the Determination of the Type of Equipment to Be Installed"—D. F. Ball, United Gas Pipe Line Co., Shreveport, La.

2:40 p.m. to 3:00 p.m.: Discussion.

3:00 p.m. to 3:20 p.m.: Recess.

3:20 p.m. to 3:40 p.m.: "Operation and Maintenance of Motor Generator Sets, Rectox Units, Wind Driven and Gas Engine Driven Units, and the Methods Used in Checking Results Obtained"—David Harrell, Houston Pipe Line Co., Houston, Tex.

3:40 p.m. to 3:55 p.m.: Discussion.

3:55 p.m. to 4:15 p.m.: "System of Records Maintained to Combat Pipe Line Corrosion"—Frank E. Hangs, Texas Pipe Line Co.

4:15 p.m. to 4:30 p.m.: Discussion.

4:30 p.m.: Adjourn to Exhibits.

8:00 p.m.: Pipe Line Banquet—Chairmen: J. A. Neath, Humble Pipe Line Co.; B. E. Hull, Texas Pipe Line Co. Main Dining Room, Houston Club.

DRILLING AND PRODUCTION PROGRAM

Convention Hall

2:00 p.m.: Prime Movers in Oil Field Operations. Sponsors: Joe J. King, United Gas Pipe Line Co.; Prof. J. H. Pound, Rice Institute.

"Power Requirements for Gulf Coast Drilling"—D. M. McCargar, Allis-Chalmers Manufacturing Co.

"The Diesel Engine in Oil Field Service"—O. A. Treiber, Hercules Motors Corp.

"Maintenance and Lubrication of Bearings in Oil Field Equipment"—S. M. Weckstein, Timken Roller Bearing Co.

"Positive Control of Lubricating Conditions in Diesel Engines"—J. M. Ravenna and Paul Williams, Skinner Purifiers, Inc.

"Air Cleaners for Oil Field Engines"—C. C. Sowerby, American Air Filter Co., Inc.

"Water Treatment in the Oil Fields"—E. F. Fellows, National Aluminate Corp.

GEOPHYSICAL PROGRAM

3:00 p.m. and 5:00 p.m.: Trip to Geophysical field. Demonstration at Aldine Gardens from the Coliseum. American Askania Corp. will make practical demonstration of Magnetometer, Torsion Balance and Gravitymeter. Free transportation.

MOTOR TRANSPORT PROGRAM

Assembly Hall, Chamber of Commerce Bldg.

10:00 a.m.: Session—Motor Transportation Committee.

2:00 p.m.: Session—Motor Transportation Committee.

ENTERTAINMENT PROGRAM, General

12:15 p.m. Junior Chamber of Commerce Luncheon—C. of C. Building.

1:00 p.m.: Golf Tournament. Ask at Administration Office, Lobby Coliseum.

1:00 p.m. to 6:00 p.m.: Skeet Shooting, Robert J. Miller, supervising—Brae-Burn Skeet Club.

WEDNESDAY, APRIL 26

Host for the Day

JOHN R. SUMAN

Vice President, Humble Oil & Refining Co.

Directors for the Day: A. M. Blow, Al Buchanan, E. F. Goggins, Dudley Hardcastle, William Keck, L. O. Koen, J. H. McEvoy, Robert J. Miller, C. B. Moore, Daniel J. Moran, George O'Leary, Louis Pearce, Arthur J. Penick, J. L. Shakely, Chase E. Sutton, J. H. Teer, John A. Worthington.

REFINERY PROGRAM

Room "D" Balcony, Coliseum

Morning Session: R. R. Jackson, chairman, superintendent, Magnolia Petroleum Co., Beaumont, Tex.; S. B. Shapiro, Vice-Chairman, Asst. Gen. Supt., Pan-American Refg. Corp., Texas City, Tex.

10:00 a.m.: "Modern Instrumentation for Topping, Cracking and Polymerization Plants"—Donald J. Bergman, Chief Eng., Universal Oil Products Co.

"Application of Automatic Controllers to Solvent Refining and Lubricating Oil Plants"—J. F. Thornton, Process Eng., and T. T. Whipple, Process Eng., Lummus Co.

Afternoon Session: John O. Sue, Chairman, Gen. Supt. Gas and Gasoline Dept., Humble Oil & Refining Co., Houston; L. K. Laney, Vice-Chairman, Petroleum Engineer, Texas Co., Houston.

1:30 p.m.: "Control Practices in Processing Natural Gas"—Henry M. Wade, President, Parkhill-Wade.

"Theoretical Discussion of Special Control Applications for Fractionating Columns"—A. J. L. Hutchinson, Fluor Corp., Ltd.

DRILLING AND PRODUCTION PROGRAM

Convention Hall

2:00 p.m.: Drilling. Sponsors: Arthur G. Levy, Fohs Oil Co.; Prof. Harold Vance, Texas A. & M. College.

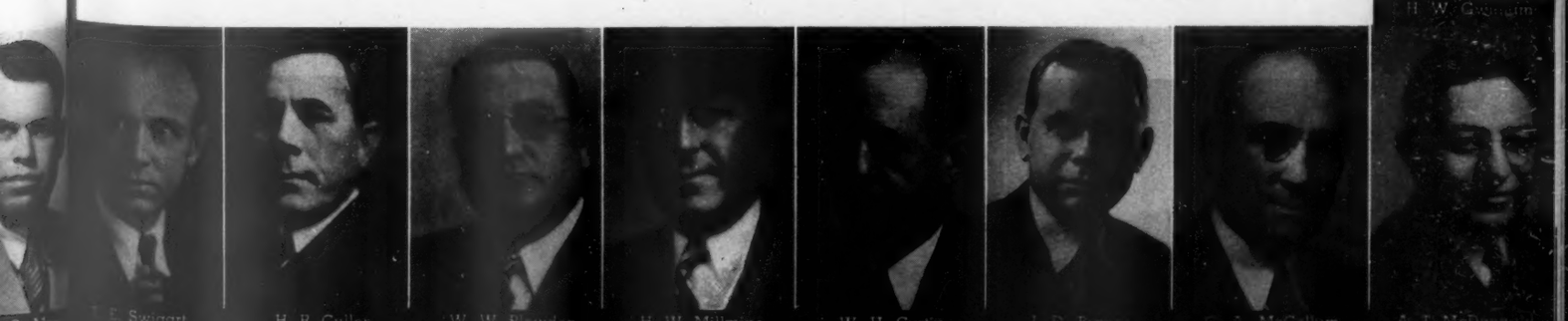
J. H. McEvoy

Al Buchanan

H. John Eastman

L. W. Gilbert

H. W. Cochran



M. E. Montrose E. G. Leonarden W. R. Martin E. R. Turner Ed Salvin George O'Leary Harry J. Moriang Frank Champion H. E.

J. W. Newton

L. O'Keen

K. W. Davis

Charles F. Roeser

C. B. Moore

Harry Lochridge

"Core Drills Applied to Oil Field Service"— J. A. Noyes, Sullivan Machinery Co.

"The Baroid High Pressure Drilling Mud Filtration Tester"—D. H. Larsen, Baroid Sales Department, National Lead Co.

"Some Defects Found in Hard-Faced Drilling Tools—and Their Remedies"—C. W. Metzger, Haynes Stellite Co.

"The Tuboscope"—Fritz Huntsinger, Oil Field Machine & Supply Co.

"Resilient Materials of Construction for the Petroleum Industry"—H. L. Lawrence, Du Pont de Nemours & Co., Inc.

"Recent Developments in Oil Well Cements"—J. B. Roberts, Lone Star Cement Corp.

7:00 p.m.: Student Contest—Convention Hall. Sponsors: Prof. Howard E. Degler, Chairman, University of Texas; Prof. Benjamin C. Craft, Louisiana State University; Prof. J. H. Pound, Rice Institute; Prof. Harry H. Power, University of Texas; Prof. Harold Vance, Texas A. & M. College.

Undergraduate students from the Engineering Departments of each of the following universities will present papers in open competition for eight cash prizes aggregating $300.00: Louisiana State University, Oklahoma A. & M. College; Rice Institute; Southern Methodist University, Texas A. & M. College, University of Texas, University of Tulsa, University of Oklahoma.

The A.S.M.E. scoring sheet for student competitions will be used by the judges. Papers will be limited to subjects relating to oil production, refining, or uses of petroleum products.

MOTOR TRANSPORTATION PROGRAM

Assembly Hall, C. of C. Building

10:00 a.m.: Session—Motor Transportation Committee.

2:00 p.m.: Session—Motor Transportation Committee.

7:00 p.m.: Motor Transportation Committee Banquet—Houston Club.

7:00 p.m.: Foreign Oil Men's Banquet in honor of visiting foreign oil men, R. L. Dudley, Chairman—Rice Hotel Ball Room.

ENTERTAINMENT PROGRAM, General

1:00 p.m.: Golf Tournament. Ask at Administration Office—Lobby Coliseum.

1:00 p.m. to 6:00 p.m.: Skeet Shooting, Robert J. Miller, supervising—Brae-Burn Skeet Club.

7:00 p.m.: Foreign Oil Men's Banquet in honor of visiting foreign oil men, R. L. Dudley, Chairman—Rice Hotel Ball Room.

THURSDAY, APRIL 27

Host for the Day

WALLACE WILSON

President, Wilson Supply Co.

Directors for the Day: F. M. Austin, L. D. Cain, H. John Eastman, E. W. Gildart, A. C. Glassell, Jr., Harry C. Hanszen, George A. Hill, Jr., O. W. Killam, Harry Leonard, Gage Lund, W. J. Morris, C. E. Naylor, George W. Strake, Edgar Tobin.

REFINERY PROGRAM

Room "D" Balcony, Coliseum

10:00 a.m.: "Steam Turbines in Refineries and Natural Gasoline Plants"—S. O. Maxwell, Terry Steam Turbine Co.

"Applications of Centrifugal Pumps to Refinery Service"—K. P. Hurley, Ingersoll-Rand Co.

1:30 p.m.: "Recent Developments in Copper Alloy Condenser Tubes"—N. W. Mitchell, Chase Brass & Copper Co.

DRILLING AND PRODUCTION PROGRAM

Room "C" Balcony, Coliseum

2:00 p.m.: Controlled Directional Drilling. Sponsors: George L. Nye, Tide Water Associated Oil Co.; James U. Teague, Humble Oil & Refining Co.

"Development and Future Trend of Controlled Directional Drilling"—M. E. Montrose, Lane-Wells Co., Los Angeles, Calif.

"Application and Procedure of Controlled Directional Drilling"—C. P. Collins, Eastman Oil Well Survey Co.

"Controlled Vertical Drilling Methods"—J. V. Robinson, Technical Oil Tool Corp.

"Polar Core Orientation"—D. C. Roberts and E. R. Webb, Sperry Sun Well Surveying Co.

2:00 p.m.: Well Completion and Production—Convention Hall. Sponsors: M. Albertson, Shell Petroleum Corp.; Joseph Zaba, Rio Bravo Oil Co.

"Properties and Uses of 'Securaloy' as Applied to Oil Well Production"—O. Hammer, Security Engineering Co., Inc.

"The Gun Perforator in Oil Well Drilling-Production Problems"—M. E. Montrose, Lane-Wells Co.

"Squeeze Cementing Before Production to Reduce Gas-Oil Ratios"—R. S. Kail, Baker Oil Tools, Inc.

"New Application of Chemistry to Oil and Gas Wells"—P. E. Fitzgerald, Dowell, Inc., Tulsa.

"Locating of Water Entries in Oil Wells by Electrical Means"—H. C. Yarbrough, Yarbrough Guns Co.

"Modern Sucker Rod Pumping Insures Low Cost Oil Recovery"—D. O. Johnson, S. M. Jones Co., Tulsa.

"Reda Submergible Electrical Centrifugal Oil Well Pumping Unit"—P. E. Loye, Reda Pump Co., Bartlesville, Okla.

12:15 p.m.: Luncheon and discussion of Drilling Contractors—Dining Room, Main Floor, Coliseum.

SAFETY PROGRAM

6:30 p.m.: General Safety Committee Stag Party. Barbecue and entertainment for Safety Engineers, Field Men, Petroleum Company Employes and their friends. Fred Rousseaux, Texas Co., Houston, Chairman—Kelley's, 910 Texas.

GEOPHYSICAL PROGRAM

3:00 p.m. and 5:00 p.m.: Trip to Geophysical field. Demonstration at Aldine Gardens from the Coliseum. American Askania Corp. will make practical demonstration of Magnetometer, Torsion Balance and Gravitymeter. Free transportation.

Richard Bloss Louis Pearce John T. Cretty Franz L. Hereford Dudley Hardcastle Edgar Tobin F. Julius Fa

ENTERTAINMENT PROGRAM, General

1:00 p.m.: Golf Tournament. Ask at Administration office, Lobby Coliseum.

1:00 p.m. to 6:00 p.m.: Skeet Shooting, Robert J. Miller, supervising—Brae-Burn Skeet Club.

FRIDAY, APRIL 28

Host for the Day

W. B. SHARP

President, Mission Mfg. Co.

Directors for the Day: J. S. Abercrombie, John O'H. Anderson, R. A. Broomfield, W. H. Curtin, R. L. Dudley, F. Julius Fohs, Frank L. Hereford, Jack Hoelzel, Thomas Hughes, E. G. Leonardon, A. T. McDannald, R. A. Mueller, Martin O'Brien, R. W. Pack, Nowery J. Smith, H. E. Treichler.

12:15 Noon: Annual Meeting of Members and Directors of the Oil-World Exposition—Rice Hotel Ball Room.

6:30 p.m.: California Association Banquet—Golfcrest Country Club.

SAFETY PROGRAM

Convention Hall

T. S. Maffitt, Jr., Safety Manager, Houston Oil Co., Chairman

10:15 a.m.: "Safety Meetings From Field Men's Viewpoint"—R. M. Bradbury, Houston Oil Co.

"Oil Field Fleet Operations"—M. E. Brock, Gulf Oil Corp., Houston.

Demonstrations. Rescue workmen who go into tanks and inclosed places. S. E. Whiting, Liberty Mutual Insurance Co.

2:00 p.m.: P. E. Keegan, Manager Personnel and Employment, Shell Oil Co., Inc., Houston, Chairman.

Speakers: Daniel Harrington, Chief U. S. Bureau of Mines Safety Section, Washington; J. J. Forbes, Chief U. S. Bureau of Mines Safety tion, Pittsburgh, Pa.

Demonstrations: Petroleum fires, gases, explosions and permissible equipment by G. M. Kintz, Associate Engineer, U. S. Bureau of Mines, Dallas.

7:30 p.m.: C. A. Miller, Assistant Personnel Manager, Texas Co., Houston, Chairman.

"Is Industry at the End of the Road?"—A. A. Nichoson, Personnel Manager, Texas Co.

Presentation of trophies and medals to the Petroleum Industry's employes who have saved lives of their fellow workmen by first aid and rescue methods by Carl J. Rutland, President, Texas Safety Association, Dallas.

REFINERY PROGRAM

Room "D" Balcony, Coliseum

10:00 a.m.: "Application of Stainless and Heat Resistant Steels in Refineries"—Karl E. Luger, Carnegie-Illinois Steel Co.

"Resume of Present Development of Alloy Steel Tubes for Pipe Stills"—H. D. Newell, Babcock & Wilcox Tube Co.

1:30 p.m.: "The Application of the Polyform Process"—Dr. E. R. Smoley, Lummus Co.

"Progress in Treating and Sweetening"—Dr. C. W. Ripple, Solvay Sales Co.

"Oil Refining Going Catalytic"—Dr. Gustav Egloff, Universal Oil Products Co.

In addition, M. W. Kellogg Co. has been invited to discuss catalytic cracking.

ENTERTAINMENT PROGRAM, General

1:00 p.m.: Golf Tournament. Ask at Administration Office, Lobby Coliseum.

1:00 p.m. to 6:00 p.m.: Skeet Shooting, Robert J. Miller, supervising.—Brae-Burn Skeet Club.

SATURDAY, APRIL 29

Host for the Day

W. L. CHILDS

Vice President, Reed Roller Bit Co.

Directors for the Day: R. E. Allison, V. E. Ashford, Thomas H. Barton, John T. Crotty, R. C. Gwilliam, R. H. Hargrove, C. A. McCollum, Harry J. Morlang, Joseph S. Morris, M. W. Phelps, Charles F. Roeser, Ed Salvin, Floyd L. Senter, W. D. Shaffer, T. E. Swigart.

10:00 p.m.: Closing Ceremonies—Convention Hall.

LOCATION OF SERVICES

N. G. Guiberson

ADMINISTRATIVE OFFICES of the Exposition, **Front Lobby, Coliseum**

FOREIGNERS MEETING ROOM for the exclusive use of foreign visitors, **Room F Lobby, Main Floor of Coliseum**

EXHIBITORS MEETING ROOMS are for the use of exhibitors only, **Rooms A and B, Balcony of Coliseum**

DIRECTORS MEETING ROOMS for the use of Directors of the Oil-World Exposition only, **Room E Lobby, Main Floor of Coliseum**

Harry C. Hanszen

MAINTENANCE OF FIRST AID ROOM. William T. Raney, American Red Cross, Houston, Chairman

U. S. POST OFFICE. J. S. Griffith, Postmaster. For the assistance and accommodation of exhibitors and visitors, **Balcony of Coliseum**

J. R. Parten

L. D. Cain

Arthur J. Penick

J. L. Shakely

Fred F. Murray

J. C. Axelson

Compressor plant for Agua Dulce Corp. recycling and repressuring operation in Agua Dulce field, Nueces County, Texas

RECYCLING

By F. V. L. Patten and F. M. Blair
Engineering Department, Railroad Commission of Texas

In recent years there have been found an increasing number of fields which produce what are essentially colorless or "water white" liquids. A characteristic of the wells in these fields is that the gas liquid ratios obtained are invariably high, ranging from ten thousand to several hundred cubic feet per barrel. Experimental work which has been carried on in the past two years has shown definitely that the materials produced from wells in fields of this type exist in the gaseous or vapor phase in the reservoir. These studies have also shown that when the pressure is decreased in such fields, the liquid will condense out of the gas phase, wet the sand grains, and will to a large extent be nonrecoverable. This phenomenon of condensation has been called retrograde condensation, and the pressure at which liquids begin to condense out of the gas phase is called the retrograde dew point.

While no particularly accurate method for the determination of retrograde dew points has been developed up to the present time, it is known that the retrograde dew point for condensate fields which are the gas caps of oil fields is identical with the virgin pressure, and experiments which have been carried out in the laboratory as well as in the field indicate that most fields under virgin conditions are very close to their retrograde dew points, even though no crude oil has been discovered in the sand. From these facts, it is apparent that the greatest ultimate recovery of the heavier hydrocarbons present in condensate fields will be obtained if the pressure is maintained at a value very close to the virgin pressure until essentially all of these hydrocarbons have been produced. Since the most feasible method of maintaining this pressure is by the reinjection of the residue gas which remains after the heavier hydrocarbons have been extracted, the discovery of these facts regarding condensate fields has resulted in a rapid growth of recycling.

Recycling developments have also received impetus from the regulations of the Railroad Commission of Texas governing the utilization of the gas produced from condensate wells. After a number of hearings held in 1938, the Railroad Commission, through an order issued January 18, 1939, classified the condensate wells in the state as gas wells. Under the oil and gas conservation statutes, natural gas produced from gas wells must be utilized for certain specific purposes and may not be vented to the air or wastefully burned. Since the market for natural gas in most gas fields is limited, it has been necessary to develop some means of disposing of, without waste, the large volume of residue gas remaining after the distillate or condensate has been extracted from the fluids produced from condensate wells. Gas recycling furnishes a practical means of disposing of this residue gas in a large number of condensate fields.

For the purpose of clarity it is advisable to define a few terms which are used to describe the injection of gas into oil and gas sands. Repressuring includes the process of injecting natural gas into oil- or gas-bearing formations for the purpose of increasing the pressure in these formations, or of disposing of the gas produced from another horizon. Pressure maintenance is the process of injecting gas into a formation for the purpose of keeping the pressure in that formation at or near a constant value. The term "gas recycling," as generally used, is a form of pressure maintenance in which the gas produced from gas wells is reinjected into the same formation. This paper deals only with developments of a recycling nature.

Factors Involved in the Determination of the Feasibility of Recycling Operations

The principal factors which are involved in a determination of the feasibility of the installation of a recycling plant are:

(a) The condensate content of the gas produced.

(b) The shut-in well head pressure.

(c) The permeability and thickness of the sand.

(d) The reserves.

(e) The ownership pattern.

(f) The operations of other producers in the field.

The recovery which will be obtained can be determined by experimental tests made as a preliminary to the design of recycling plants. Usually such tests are conducted with full scale apparatus which consists of a high-pressure separator with exchanger through which the fluids produced from the well can be cooled by the expanded residue gas from the separator and appropriate devices for measuring gas and liquid volumes. One company, however, has carried out extensive experimental work in Texas utilizing a small scale apparatus and sampling only a portion of the fluids produced from the well. It is almost universally found that the maximum recovery will be obtained at pressures ranging from 750 to 1,000 pounds per square inch, and that above this pressure the recovery decreases more or less rapidly. A set of curves relating recovery to separator pressures and temperatures is shown in Figure 1.

Optimum Operating Pressure

After the condensate recovery at various pressures and temperatures has been ascertained, the optimum operating pressure or the feasibility of installing a recycling plant can be determined from the required compression ratio and the corresponding recovery obtained. In most of the plants which are operating at the present time the separators are maintained at a pressure somewhat higher than those at which the maximum recovery is obtained in order to reduce the compression cost. The compression ratio, and consequently the compression cost, is determined by the ratio between the separator pressure and the pressure which must be maintained at the well head of the injection well in order to introduce the desired volume of gas. Figure 2 shows calculated values of shut-in pressures and injection pressures in wells having open flow potentials of 100,000,000 cu. ft. per day if 10,000,000 cu. ft. of gas per day is injected. If properly completed, wells in most condensate fields will have open flow potentials of at least 100,000,000 cu. ft. of gas per day, and the differences between the shut-in and injection pressures will in most instances be less than that shown in this figure. The writers have knowledge of one injection well in which approximately 17,000,000 cu. ft. of gas per day is being injected at a pressure less than 50 pounds greater than the shut-in pressure. In another injection well 50,000,000 cu. ft. of gas per day has been injected at a pressure approximately 350 pounds above the shut-in pressure. In any field it is essential, as a preliminary, to make back-pressure tests on the well or wells which are to be used for injection purposes in order to be able to calculate with a fair degree of accuracy the well head pressures which will be required for injection.

It is necessary in any recycling project, obviously, that the reserves be large enough for the plant to pay out before the extractable liquids are depleted. In making calculations it should be remembered that the reserves in condensate fields measured in terms of the extractable liquid are generally less than one-tenth of those which would exist if the sand were filled with oil. This requires that much larger acreage and considerably wider spacing be used in recycling operations than in crude oil production.

Before deciding on the adequacy of reserves and establishing a drilling pattern it is necessary to estimate the volume of wet gas which will be produced before the dry gas which has been returned to the formation reaches the producing

OPERATIONS IN TEXAS

wells. The determinations and calculations of Muskat[1] and his associates should be of assistance in making decisions on these matters. Thus Muskat has found from theoretical considerations that in a system consisting of one injection well and one producing well in a large field the volume of gas which will be swept up by the dry gas will be equal to one-third of that which will be contained in a circle having a radius equal to the distance between the two wells. It has also been found that in a five-spot system with four equally spaced producing wells and one injection well the volume which will be swept up will be equal to 72.3 per cent of that which would be contained in a square whose sides connected the four producing wells.

The desirability of installing a recycling plant will be further influenced by the operations of other producers in the field, since if gas is wasted by other operators and as a consequence the pressure of the field decreases appreciably, the gas which will be produced will become leaner and recycling operations will in most instances become less profitable.

Types of Recycling Plants

The recycling plants which are now in operation in Texas may be divided into three types: (1) Those using moderate cooling and separation; (2) those using dehydration, extreme cooling and separation; and (3) those using high-pressure absorption.

The simplest type of recycling plant is that in which the fluids are cooled to a temperature above that at which hydrates form and the condensate extracted. Hammerschmidt[2] has determined the temperatures required for hydrate formation for a comparatively dry natural gas. His curves indicate that hydrates will begin to freeze at a temperature of approximately 65° F. at a pressure of 1,200 pounds per square inch. This value appears to be approximately correct for most mixtures produced from condensate wells since the operators of various recycling plants have reported difficulties with hydrates at temperatures between 56° F. and 68° F. when the pressure was around 1,200 pounds per square inch.

Where it is desirable to cool the fluids to temperatures below those at which hydrates form, it is necessary to inject a brine into the flow stream to reduce the water vapor pressure. In one plant with which the writers are familiar, calcium chloride brine is injected at a point immediately preceding the heat exchanger. The fluids from the well are then cooled by the residue gas from which the condensate has been extracted and finally cooled in an ammonia cooler. Two separators are used, one to take out the diluted brine and one for the purpose of removing the condensate. It is possible to use temperatures of the order of 0° F. in a system of this type.

A variation of this system which has been suggested involves the use of an additional separator preceding the point at which the brine is injected to remove all of the water which has condensed at this point. The value of such a procedure would be that the injected brine would be diluted to a lesser extent and less evaporation would be required. Still another system which is being used involves the reinjection of a portion of the liquid separated in the high-pressure separator into the flow stream at a point preceding the separator. This liquid is brought into intimate contact with the fluids from the well in what has been termed a liquedenser. The recycled liquid is cooled before injection and the final cooling of the fluids from the well is obtained with this cooled liquid.

The choice of the proper recycling system will depend upon the composition of the fluids produced from the field. Those fields which produce lighter or more volatile condensates with a relatively high percentage of intermediate hydrocarbons will require one of the more elaborate systems and much lower temperatures for essentially complete recoveries. On the other hand,

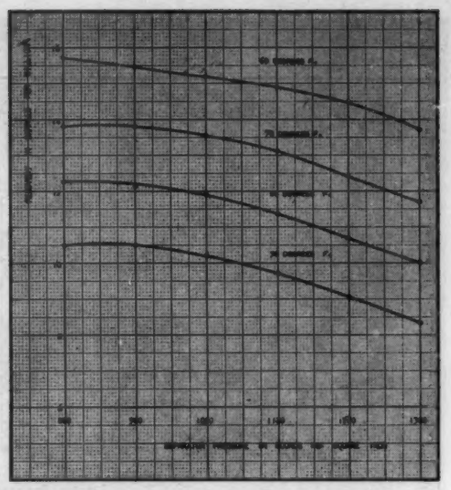


Fig. 1—Recovery vs. pressure curves for a condensate well

where a heavy condensate is produced and the intermediate hydrocarbons are present in relatively low percentages it may be more economical to use a more simplified system which involves only moderate cooling. In fields where the gas is produced at pressures considerably above those at which the separation takes place, use may be made of the Joule-Thompson effect and the final cooling with ammonia may in some instances be eliminated, thus decreasing the cost of the installation.

Stage Separation

The plant referred to in Figure 1 utilizes stage separation of the extracted liquid. Greater recoveries would be obtained if stabilizing units were used. Such additional units have been installed in plants located in those fields in which the liquids produced are relatively volatile and where extremely low temperatures are employed in extraction.

One plant in the state is now using oil absorption for the extraction of condensate. The absorbers are operated at between 1,100 pounds and 1,200 pounds per square inch, and the operators of this plant report that they are able to obtain almost complete recovery by this method. It has been suggested that it may be practicable to operate oil absorption plants at pressures up to 1,-

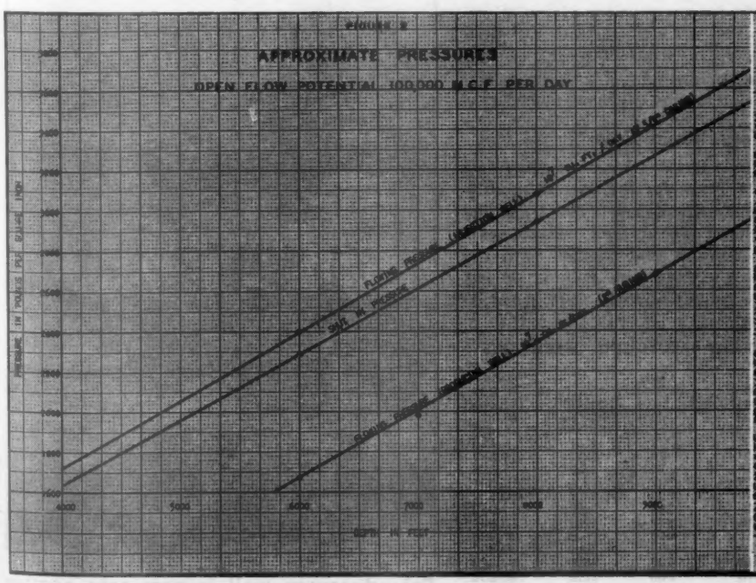


Figure 2

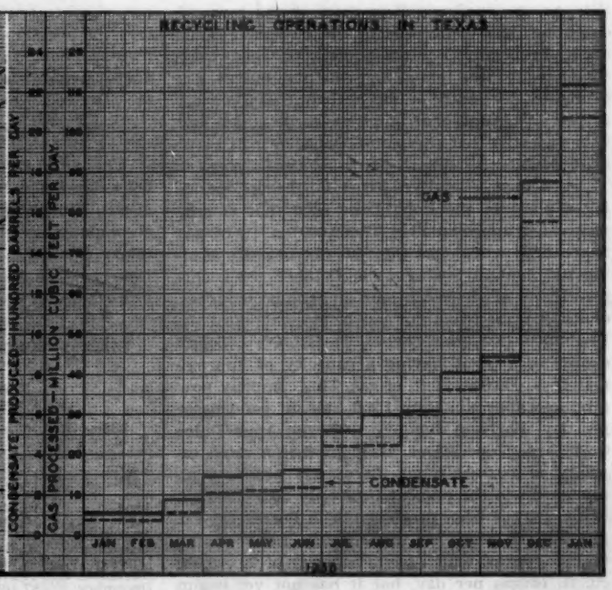


Figure 3

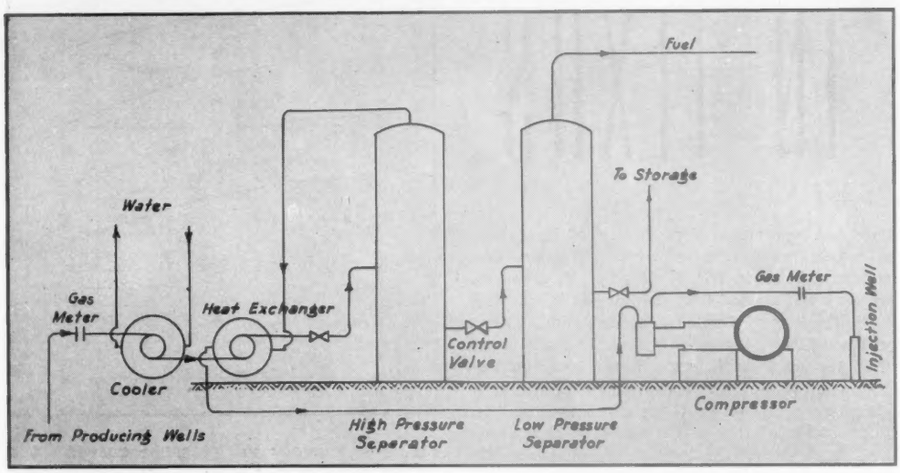


Diagram of gas recycling system

500 pounds per square inch, if suitable absorbing oil is available.[3]

Cost of Recycling

After properties suitable for development have been acquired, the principal cost of recycling operations in most instances would be the cost of drilling the wells and installing and operating the compressors. J. H. Dunn[4] has compiled some very informative tables governing compressor costs for installations of various sizes. The additional cost of a plant will depend upon the type of extraction a system used. The simpler systems utilizing moderate cooling require an outlay which is relatively small compared to that of drilling the wells and installing and operating compressor stations. In the more elaborate systems in which extreme cooling or oil absorption is used, the cost of extraction becomes a very appreciable factor.

Development of Recycling

The first recycling plant in Texas, that of the Process Oil Co. in the Agua Dulce field, began operating in January 1938. This plant has a capacity of approximately 9,000,000 cu. ft. of gas per day and processes gas produced from one well. The second plant in the state was that of the Tide Water Associated-Seaboard Oil Co. in the Cayuga field, which began operating in March 1938, as an experimental unit for the purpose of obtaining data to be used in the design of other units. In May 1938, two additional wells were connected to the plant and the volume of gas processed increased to more than 10,000,000 cu. ft. per day. Additional units are to be added and it is expected that the plant's capacity will be at least doubled.

In August 1938, Byrd-Frost Co. began operating a plant in the Long Lake field that is now processing approximately 17,000,000 cu. ft. of gas from three wells. The Sun Oil Co. began operating its plant at Seabreeze in October 1938. This plant is an experimental one and the permanency of its operation has not yet been established. In December 1938, the Corpus Christi Corp. began operating a plant having a capacity of approximately 50,000,000 cu. ft. of gas. This company now produces approximately 1,200 bbls. of condensate per day. Early in January 1939, the Agua Dulce Corp. began operations. Its plant has a rated capacity of 60,000,000 cu. ft. of gas per day, although up to the present time only 30,000,000 cu. ft. of gas has been processed. The Portex Oil Co. has built a plant in the Joaquin field, Shelby County, Texas, which has a capacity of 20,000,000 cu. ft. of gas per day, but it has not yet begun continuous operations.

In addition to those plants which are now operating there are several others which are either in the process of construction or for which plans have been made. The American Liberty Oil Co. is now constructing a plant to inject the gas produced from condensate wells in the Grapeland field. Champlin, Bass and Patton are installing a recycling plant in the Long Lake field. The Tide Water Associated-Seaboard Oil Co. also plans to construct a recycling plant in the Long Lake field.

A permit has been granted for the construction and operation of an experimental plant in the Pledger field by the Danciger Oil & Refining Co. and the Humble Oil & Refining Co. The Railroad Commission also has issued an order instructing the operators in the Old Ocean field to provide facilities for returning the gas produced from the wells in this field to the reservoir. A compressor has been installed and experimental operations will begin shortly. When completed, this plant will probably have a capacity of 150,000,000 cu. ft. of gas per day.

The Hamman Exploration Co., owner of a number of condensate wells in the Hamman field, has announced its intention to reinject the gas produced from these condensate wells as soon as a plant can be designed and installed. The plant probably will process around 30,000,000 cu. ft. of gas per day.

Experiments have been conducted in a number of other fields for the purpose of investigating the desirability of constructing recycling plants. Those fields in which tests have been made include the following: Agua Dulce, Bammel, Driscoll, Katy, Palacios, McAllen, and Rooke.

Very Rapid Rate

The very rapid rate at which recycling has been developed in Texas for the past 14 months is well illustrated by the data in Table 1 and the accompanying chart. These data which were taken from the monthly reports filed with the Railroad Commission show the volume of gas processed and the volume of condensate produced in the various recycling plants operating in the state.

TABLE 1—SUMMARY—RECYCLING OPERATIONS

	Gas processed m.c.f. pr/day	Condensate produced bbls./day	Recovery bbls. per million	Volume of gas injected m.c.f. pr/day
1938—				
January	5,760	77	13.4	5,420
February	5,726	74	12.9	4,887
March	8,798	114	13.0	7,619
April	14,378	207	14.4	12,834
May	14,937	220	14.7	13,957
June	16,141	235	14.6	14,942
July	25,848	440	17.0	15,861
August	29,851	442	15.3	27,286
September	30,810	598	19.4	29,367
October	40,246	727	18.1	37,820
November	44,270	860	19.4	40,652
December	87,465	1,554	17.8	67,293
1939—				
January	111,716	2,089	17.7	102,522

The fields which have been mentioned constitute practically all of those in the state in which recycling of natural gas seems probable within the near future. It should be pointed out, however, that as drilling is carried to greater depths, the necessity of pressure maintenance by gas recycling will become more and more apparent. The reasons for this are twofold: First, it appears that with deeper drilling a larger number of condensate wells will be found; and, second, as higher pressures are encountered the waste which will result if pressures are not maintained will become greater.

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SPARTA-WILCOX

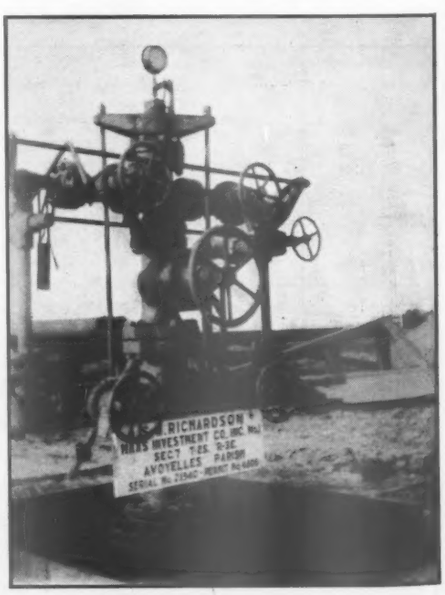
(Continued from Page 73)

nated, but in eastern Texas most of the buying has been limited to old prospects considered to have a good mathematical chance of producing oil. Some block leasing has taken place in Louisiana, but most of the buying has been confined to buying on old prospects.

It now appears that most of the larger concerns will undertake programs of varying proportions in the trend, but that they will move in their accustomed unhurried manner. This will likely result in the trend's future being one of prolonged development, rather than a short furor of activity. It also appears that, at least for some months to come, the burden of drilling will fall upon the independents.

From all angles it now seems apparent that the Sparta-Wilcox trend may be one of the outstanding developments of 1939.

During the coming months, which will constitute the first phase of the trend's development, it is expected that the activity and development will come more rapidly on the Louisiana end of the trend. This is true not alone because of the attractive allowables there, but because in addition to the Wilcox producing horizon you have the Sparta sands thrown in for *lagniappe*.



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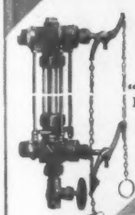
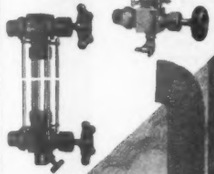
Ejector, Syphon or Jet Pump


"Navy Type" Liquid Level Gage

"Safeguard" Automatic Liquid Level Gage


"All-Iron" Automatic Liquid Level Gage

Gas Engine Lubricator

Snap Lever Oiler

Plain Brass Oil Cup

Plain Compression Grease Cup

● "It is the most simple gage to service that I have ever seen." This statement is typical of the remarks made throughout the oil fields since the Penberthy Reflex Gage was introduced.

Note particularly the U-Bolt type of construction that is the strongest and the simplest to service. To replace a glass, simply remove the nuts on the face of the gage . . . it is unnecessary to work between the gage and the boiler.

The Penberthy Reflex Gage shown here is available in both Navy Bronze and Malleable Iron; it is recommended for working pressures to 350 lbs. at 450° F. Gage is furnished complete with Penberthy "Dripless" Drain Cock shown.

Other Penberthy Reflex Gages are made in any length desired for higher pressures and for various kinds of liquids. Any leading oil well supply distributor will be pleased to quote upon your particular requirements.

PENBERTHY PRODUCTS

PENBERTHY INJECTOR COMPANY Manufacturers of QUALITY PRODUCTS Since 1884
DETROIT, MICH. • Canadian Plant, Windsor, Ont.

Screw Plunger Grease Cup

Spring Compression Grease Cup

Automatic Electric Sump Pump

Automatic Cellar Drainer (Water or Steam Operated)

Dipless Air Cock

Production and Gravities in Gulf Coast Fields

The following tabular story of the Gulf Coast fields of Texas and Louisiana is a very valuable reference work, as it gives the names of all the pools, the counties in which they are located, the number of producing wells in each pool, daily average production, depths of the pay formations, gravity of the oil, market outlet, and the number of wells drilling in each pool as of March 15. The Texas Gulf Coast had 10,292 oil wells, producing 358,644 bbls. per day, an average of 34.85 bbls. per well per day, while the combined Texas and Louisiana coastal area had 11,631 oil wells, producing 555,175 bbls. of oil or an average of 47.73 bbls. per well per day. The wells in the Louisiana coastal fields produce an average of 147 bbls. per well per day, as they are not under the tight rein that controls the output of wells in the Texas coastal district.

TEXAS UPPER GULF COAST DISTRICT

(Data as of March 15, 1939)

Name of field and location (county)—	Prod. wells	Daily average prod.	Wells drlg.	Prod. depth	Gravity A.P.I.	Base	Outlet
Ace, Polk	3	80	1	4,806-16 7,748-62	40	Para.	Shell
Allen, Brazoria	1	7	0	4,348-5,537	28-41	Para., Naph.	Barge
Amelia, Jefferson	115	3,141	2	6,770-90	28.7	Naph.	Humble
Anahuac, Chambers	273	7,812	2	6,930-7,090	36.9	Para.	Humble; Gulf
Ariola, Hardin	10	440	0	3,000-4,730	24-42	Para.	Texas
Armour, Matagorda	4	255	0	6,600, 7,196	33-36	Para.	Tank cars
Bammel, Harris	3	182	1	6,100-6,200	58	Para.	None
Barbers Hill, Chambers	153	8,078	3	3,400-6,700	24-33.4	Naph.	Humble; Sinclair Prairie; Sun; Atlantic; Texas
Batson, Hardin	222	1,735	2	1,100 3,600-5,700	25-38	Naph., Para.	Sun; Gulf
Bay City, Matagorda	18	2,220	1	8,100-9,300	35-55	Para.	Tank cars
Big Creek, Fort Bend	26	612	1	2,600-4,500	20-42	Naph., Para.	Gulf
Blue Ridge, Fort Bend	47	742	1	1,900-4,600	18-26	Naph.	Humble.
Boling, Fort Bend-Wharton	87	1,676	1	2,500-4,800	19-36	Naph., Para.	Humble; Sinclair Prairie
Brenham, Washington	23	39	0	220-1,500	14-19	Asph.	Trucks
Buckeye, Matagorda	4	207	0	9,900 7,800-7,900	38	Para.	Tank cars
Call, Newton	1	0	0	6,908-18	29	Para.	Texas
Cedar Point, Galveston Bay	9	575	1	4,413-30 5,900-6,000	36	Para.	Humble
Cheek (North), Jefferson	3	75	0	8,400, 8,600	43, 56	Para.	Magnolia
Clam Lake, Jefferson	4	226	1	5,913-29 2,387-97	34 24	Naph., Para.	Barge
Clay Creek, Washington	53	538	0	1,100-1,500	22-27	Naph.	Tank cars
Clear Lake, Harris	4	256	1	5,895-5,979	26-34	Para.	Humble
Cleveland, Liberty	11	355	0	5,700-5,800 9,090-9,100	40 Distillate	Para.	Gulf; Magnolia
Clinton, Harris	8	340	1	3,200-4,000 8,100	22-48	Naph., Para.	Stanolind
Conroe, Montgomery	935	27,844	0	5,000-5,200	35-40	Para.	Tide Water; American Liberty; Humble; Sun
Cordele, Jackson	18	1,034	3	2,600-2,700 6,200-6,300	22-25	Naph.	Tank cars
Cotton Lake, Chambers	37	1,845	1	6,400-6,500	29-42	Para.	Sun
Damon Mound, Brazoria	34	258	2	1,400-3,700	21-33	Naph.	Humble; Sinclair Prairie
Danbury, Brazoria	11	514	3	1,500-2,000	22-28	Naph.	Texas
Dickinson and Gillock, Galveston	190	7,515	6	7,800-9,300	36-54	Para.	Humble; Martex; Stanolind; Pan American
Edna, Jackson	6	4	0	3,200-5,300	46	Para.	Tank cars
Esperson, Liberty	43	1,390	1	2,200-7,300 8,000	21-32	Naph.	Sun
Eureka, Harris	25	1,863	2	7,600-7,700	34-50	Para.	Tank cars
Fairbanks, Harris	161	7,812	14	6,800-6,900	38	Para.	Humble
Fannett, Jefferson	19	554	1	3,200-6,600	26-38	Naph., Para.	Gulf
Francitas, Jackson	1	227	2	7,300-7,400	42-60	Para.	Tank cars
Friendswood, Harris	127	5,887	6	5,700-6,050	30.1	Para.	Humble
Ganado, Jackson	2	37	0	5,080-5,100	26	Naph.	Texas
Garwood, Colorado	2	23	0	6,000-6,200	Distillate	Para.	Tank cars
Goose Creek, Harris	89	1,604	0	1,200-4,650 2,700-3,800	20-36 22	Naph.	Humble; Gulf
Greens Lake, Galveston	2	21	1	6,800	Distillate	Naph., Para.	Tank cars
Hankamer, Liberty	34	1,009	2	2,500-4,900	15-32	Naph.	Gulf
Hardin, Liberty	114	6,056	3	7,500-7,770	37-50	Para.	Magnolia; Atlantic
Hastings, Brazoria	612	19,196	3	5,100-6,100	30-33	Para.	Pan American; Stanolind
High Island, Galveston	64	1,776	1	3,600-6,700	24-40	Naph., Para.	Stanolind
Hitchcock, Galveston	11	912	0	5,130-50	30	Naph.	4-inch line, Texas City
Hull, Liberty	166	7,127	1	1,450-5,800	17-45	Naph.	American; Humble; Sun; Gulf
Humble, Harris	254	3,385	1	6,500-5,650	17-45	Naph.	Texas; Magnolia; Humble; Sun
Kittrell, Houston	13	774	0	1,900-2,100	24	Naph.	Tank cars
Labelle, Jefferson	3	640	1	8,250-8,650	45-Dist.	Para.	Barge
League City, Galveston	5	420	6	8,900-9,300	42	Para.	Phillips
Livingston, Polk	87	1,996	0	4,100-4,300	40	Para.	Shell
Lockridge, Brazoria	42	1,618	1	6,300-6,350	27	Naph.	Gulf
Lost Lake, Chambers	8	116	0	2,725-2,825 6,400-7,100	23	Naph.	Humble
Louise, Wharton	30	1,134	1	5,100-5,900	26-38	Naph., Para.	Texas
Lovells Lake, Jefferson	5	318	3	7,700-50	36	Para.	Humble; Gulf
Magnet, Wharton	27	978	2	5,500 5,000-5,700	25.5	Naph.	Texas
Manvel, Brazoria	167	8,310	1	3,850-4,150	24-30	Naph.	Texas
Markham, Matagorda	41	1,536	1	2,300-4,300	25-40	Naph.	Texas
Markham (North), Matagorda	2	144	0	7,700-50	34	Para.	Texas
Mauritz, Jackson	2	121	0	5,600	27.6	Naph.	Texas
Mykawa, Harris	33	1,267	1	4,125-4,900	27-30	Naph.	Humble
Nome, Jefferson	43	1,372	0	6,000-6,100 450-1,150	26.9	Naph.	Sun
North Dayton, Liberty	8	92	0	4,000-5,100	22-33	Naph.	Sun
Old Ocean, Brazoria	27	7,876	5	8,600-10,600 2,550-5,300	52-68	Para.	Texas
Orange, Orange	76	2,445	5	5,500-6,100 2,600-4,100	20-35	Para., Naph.	Humble; Sun; Gulf
Orchard, Fort Bend	17	470	0	6,600-7,800	22-51	Naph., Para.	Gulf
Palacios, Matagorda	4	115	0	7,800-9,300	54	Para.	Barge and tank cars
Pickett Ridge-Kubela, Wharton	44	1,649	2	4,500-4,700	22-25	Naph.	Texas
Pierce Junction, Harris	71	2,739	2	3,100-5,500	21-41	Naph., Para.	Humble; Gulf; Shell
Port Neches, Orange	19	1,130	0	3,100-5,900 3,125-3,350	19-38	Naph., Para.	Texas; Sun; Humble
Raccoon Bend, Austin	169	2,879	0	4,000-4,100	16-38	Naph., Para.	Humble

When Attending the

OIL WORLD EXPOSITION

Visit Our HOUSTON PLANT

We extend a cordial invitation to visit this plant and inspect our complete facilities for serving the gulf coast area.

THE NATIONAL SUPPLY COMPANY

EXECUTIVE OFFICES: PITTSBURGH, PA. DIVISION OFFICES: FT. WORTH, TEXAS; TULSA, OKLA.; TORRANCE, CALIF. GENERAL SALES OFFICE: TOLEDO, OHIO

Name of field and location (county)—	Prod. wells	Daily average prod.	Wells drlg.	Prod. depth	Gravity A.P.I.	Base	Outlet
Sandy Point, Brazoria	8	275	0	6,500	39	Para.	Sinclair Prairie
Saratoga, Hardin	230	1,016	0	550-3,300	13.3-25	Naph.	Gulf; Sun
Satsuma, Harris	11	410	2	6,800	42-45	Para.	Humble
Seebreeze, Chambers	14	490	2	8,200-8,800 4,700-4,800	40-50 40-64	Para.	Sun
Segno, Polk	48	2,344	3	7,748-62	....	Para.	Gulf
Silsbee, Hardin	35	1,897	1	6,900 525-1,300	43-45	Para.	Atlantic
Sour Lake, Hardin	140	1,198	0	1,700-4,450	16-31	Naph.	Gulf; Stanolind; Texas
South Houston, Harris	94	3,080	0	3,800-4,000 4,800	19-25	Naph.	Stanolind
South Liberty, Liberty	39	424	0	2,050-4,900 2,550-3,575	21-47	Naph., Para.	Humble; Sun; Gulf
Spindletop, Jefferson	144	2,157	1	4,025-5,800	26-29	Naph.	Stanolind; Gulf; Atlantic; Texas; Humble; Sun
Spurger, Tyler	15	1,067	1	7,600-7,700	43-45	Para.	American
Sugarland, Fort Bend	51	3,280	0	2,950-3,925	27-35	Naph., Para.	Humble
Thompson (deep), Fort Bend	212	10,647	{	3,025-4,025	25-43	Para., Naph.	Humble
Thompson (shallow), Fort Bend	21	467	3 }	5,125-5,450	....		Humble
Tomball, Harris	389	7,910	2	5,500-5,600	37-41	Para.	Humble; Magnolia
Turtle Bay, Chambers	31	1,072	2	6,500-6,600	32	Para.	Humble
Vanderbilt, Jackson	1	63	0	5,500	31	Para.	Tank cars
Van Vleck, Matagorda	32	1,720	2	7,000-7,200, 8,200	35-56	Para.	Texas
West Beaumont, Jefferson	46	2,380	2	4,500-6,700	27-29	Naph.	Sun
West Columbia, Brazoria	92	4,558	5	2,650-5,925	20-29	Naph.	Humble; Texas; Sinclair Prairie
West Ranch, Jackson	6	305	1	5,000-5,100	25	Naph.	Storage
Withers, Wharton	107	3,328	5	5,500	26	Naph.	Texas
Caplen, Galveston	1	150	1	7,748-78	34	Para.	Barge
Total Upper Gulf Coast	6,749	217,861	137				

TEXAS LOWER GULF COAST DISTRICT

Aqua Dulce, Nueces	39	630	3	4,900	60	Para.	Tank cars
Aqua Dulce (North), Nueces	2	60	0	4,800	Distillate	Para.	Tank cars
Alfred, Jim Wells	3	21	0	3,200-3,300	47.2	Para.	Tank cars, trucks
Alice (South), Jim Wells	81	3,570	6	4,700-5,400	45	Para.	Southern Minerals
Angelita, San Patricio	2	34	0	5,300	31	Para.	None
Baldwin, Nueces	8	317	0	3,800, 4,000	24-25	Naph.	Texas
Bandera, Jim Wells	1	shut in	0	6,400 3,800-4,000	Distillate	Para.	None
Bentonville and Richard King, Nueces	18	760	1	5,300-5,600	39-42	Naph., Para.	Crude Oil P. L.
Caesar, Bee	23	255	0	3,000	25-27	Naph.	Tank cars
Chapman Ranch, Nueces	2	17	0	5,000, 6,550	41-42	Para.	Texas
Clara Driscoll, Nueces	49	2,268	6	3,800-5,600	27-31	Naph.	Crude Oil P. L.
Clara Driscoll (South), Nueces	12	714	1	3,900-5,800	43	Para.	Crude Oil P. L.
Coleto Creek, Victoria	20	442	1	2,200-4,400	19-23	Naph.	Tank cars
Dirks, Bee	96	1,815	0	3,800-3,900	47	Para.	Atlantic; Pettus Ref. Co.
East Telferner, Victoria	2	90	0	5,100	27	Naph.	Tank cars
Flour Bluff, Nueces	111	4,367	0	6,600	41.8	Para.	Humble
Foley, Bee	4	32	0	4,000-4,200 3,500 4,420	46 21 21-26	Para.	Pettus Ref. Co.
Greta, Refugio	209	6,160	0	5,800-6,200	35-38	Naph.	Atlantic; Texas; Humble
Heyser, Calhoun-Victoria	217	11,926	2	5,400-6,000	32-36	Para.	Humble
Hordes Creek, Goliad	2	30	0	4,500	47.2	Para.	Trucks
Keeran, Victoria	16	575	1	5,400-5,800	37-56	Para.	Gulf
Kingsville, Nueces	6	39	0	2,100-3,200	21-22	Naph.	Humble
La Blanca, Hidalgo	7	shut in	0	6,600-7,800 5,400	48-62	Para.	Local refineries
La Rosa, Refugio	26	2,192	4	5,900, 6,300	39.8	Para.	La Rosa (under construction)
Las Mestenas, Hidalgo	2	43	0	6,700 4,700	Distillate 25	Para.	Tank cars
London, Nueces	2	36	0	4,900 4,300	Distillate	Para.	Texas
Luby, Nueces	107	6,894	3	5,000	44	Para.	Amsco
Lucas, Live Oak	9	64	0	2,500, 3,500	23-52	Para., Naph.	Tank cars
McAllen, Hidalgo	1	30	0	5,900 6,500	Distillate	Para.	None
McCampbell, Aransas-San Patricio	188	8,017	25	6,800, 7,000	39-46	Para.	Atlantic
McFaddin, Victoria	30	2,100	4	4,400	25	Naph.	Barnsdall
McFaddin (North), Victoria	1	17	0	4,400	25	Naph.	Barnsdall
McNeil, Live Oak	4	68	0	4,300	44	Para.	Tank cars and trucks
Mellon Creek, Refugio	3	215	3	5,800	37.5	Para.	La Rosa (under construction)
Mercedes, Hidalgo	5	102	0	7,400-7,500	49	Para.	Trucks
Midway, San Patricio	12	580	0	5,300	34	Para.	Humble
Normanna, Bee	4	34	0	3,650	38	Para.	Trucks
O'Connor, Refugio	4	184	0	3,100-4,100	21-42	Naph., Para.	Humble
Oakville, Live Oak	8	181	1	2,700-2,800	23	Naph.	Trucks
Pettus, Bee	39	620	0	3,900	45	Para.	Humble; Atlantic
Pettus (North), Bee	73	1,106	0	3,600	45	Para.	Atlantic
Placedo, Victoria	157	6,784	0	4,700, 6,000	24-36	Naph., Para.	Barnsdall
Placedo (East), Victoria	9	630	1	6,300	32-40	Naph., Para.	Barnsdall
Plummer, Bee	13	274	0	3,000	25-27	Naph.	Tank cars
Plymouth, San Patricio	168	12,767	0	5,500-5,950	31.3	Naph.	Republic; Sinton
Port Lavaca, Calhoun	5	20	0	6,100-6,200 2,200-2,400	41-60	Para.	Tank cars and trucks
Premont, Jim Wells	34	284	0	3,100-3,200	20-22	Naph.	Tank cars
Premont (East), Jim Wells	4	192	1	6,500	36.5	Para.	Tank cars
Ray, Bee	16	267	0	3,900 3,625-3,900	47 23-35	Para.	Atlantic
Refugio, Refugio	186	6,227	2	4,900-6,650 4,100	32-39	Naph., Para.	Texas; Atlantic; Houston; Humble
Sandia, Jim Wells	3	shut in	0	5,100	41-52	Para.	Tank cars
Sarco, Goliad	1	3	0	5,000	47	Para.	Trucks
Saxet (deep), Nueces	273	15,101	{ 4 }	5,550-7,200	38-58	Para.	{ Humble; So. Minerals; Republic; Taylor Ref. Co.; Crude Oil P. L.;
Saxet shallow), Nueces	373	15,536	} {	3,100-4,850	23-26	Naph.	{ Texas; and other refineries
Saxet (West), Nueces	59	3,774	2	3,800-7,000	34.7	Para.	Crude Oil P. L.
Sinton, San Patricio	2	10	0	5,425-5,950	33-44	Naph., Para.	Tank cars
Slick, Goliad	1	6	1	4,200-4,400	49	Para.	Trucks
South Burnell, Karnes	32	790	0	3,600	45.7	Para.	Tank cars
Stratton, Nueces	8	340	0	4,800-6,050	49. Dist.	Para.	Corpus Christi Corp.
Strauch, Bee	2	4	0	4,200	47	Para.	Atlantic
Taft, San Patricio	70	2,140	0	3,925-4,950	23-24	Naph.	Republic; Sinton
Tomoconnor, Refugio	376	13,489	5	5,525-5,950	38-39	Para.	Humble; Texas; Atlantic
Tuleta (West), Bee	22	355	0	3,900	47	Para.	Atlantic; Pettus Ref. Co.
Tulsita, Bee	2	10	0	3,625	45	Para.	Storage
Voss, Bee	2	12	0	4,000	47	Para	Pettus Ref. Co.

Down and up

The threat of stored gasoline overhanging the market today is less by 6 million barrels than it was a year ago

On February 18, 1939, gasoline stocks were 83 million barrels—

On February 18, 1938, they were 89 million barrels, the American Petroleum Institute reports

And motorists are burning more gasoline this year than last

Stocks lower, consumption higher—that's a pretty picture for the Dubbs refiner

He makes the kind of gasoline the motorists want

And he doesn't have to run too much crude or make too much fuel oil doing it

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

Name of field and location (county)—	Prod. wells	Daily average prod.	Wells drlg.	Prod. depth	Gravity A.P.I.	Base	Outlet
Westlaco, Hidalgo	1	shut in	0	8,600	51	Para.	None
White Point, San Patricio	3	69	1	4,950	23	Naph.	Trucks
White Point (East), San Patricio	49	3,434	11	5,660	38.3	Para.	Republic
Saxet Heights, Nueces	224	1,660	0	4,125	23-25	Para.	Potter; Saxet; Texas; Republic; Southern
Total Lower Gulf Coast	3,543	140,783	89				
Total Texas Gulf Coast	10,292	358,644	226				
Average daily production, per well, 34.85 bbls.							

LOUISIANA GULF COAST DISTRICT

Abbeville, Vermilion	4	449	1	6,400, 7,800	38-41	Para.	Barge
Anse La Butte, St. Martin	8	68	0	825-2,625	22.5-25	Naph.	Barge
Bancroft, Beauregard	10	1,939	2	7,200-7,300	3.7	Para.	Republic
Bateman Lake, St. Mary	1	374	2	8,600-10,800-900	37	Para.	Barge
Bay Baptiste, Terrebonne	1	shut in	0	11,172-78	50	Para.	Barge
Bauyou Blue, Iberville	1	68	0	1,725-5,200	18-26	Naph.	Barge
Bayou Bouillon, St. Martin	2	97	0	2,800-4,300 6,800	25	Naph.	Barge
Bayou Des Allemonds, St. Charles	3	229	1	7,200-9,400	35	Para.	Barge
Bayou Mallet, Acadia	3	267	0	6,300-7,000	27-46	Para., Naph.	Pure
Bay St. Elaine, Terrebonne	2	510	1	2,700-6,800	29	Naph.	Barge
Big Lake, Cameron	3	34	0	7,900-9,000	38-40	Para.	Barge
Bird Island, Plaquemines	4	1,356	1	6,100-7,100	27	Naph.	Barge
Black Bayou, Iberville	20	4,897	1	3,800-6,600	18-23	Naph.	Barge
Bosco, Acadia	54	4,956	0	7,800-9,100	36-45	Para.	Pure
Caillou Island, Terrebonne	38	14,867	1	3,200-6,800	24-39	Naph., Para.	Barge
Cameron Meadows, Cameron	24	2,329	1	3,200-5,200	22-27	Naph.	Barge
Cankton, St. Landry	1	28	0	5,300	28	Naph.	None
Chacahoula, La Fourche	2	839	2	7,200 8,500	33 Distillate	Para.	Barge
Chalkey, Cameron	2	227	2	8,900	38	Para.	None; oil run to storage
Charenton, St. Mary	47	6,227	3	1,100-7,200	21-36	Naph., Para.	Barge
Cheneyville, Rapides	4	463	1	5,700, 6,200 8,200	42-44 37	Para.	Standard of La.
Choctaw, Iberville	10	1,229	2	2,400-5,400	26-29	Naph., Para.	Standard of La.
Creole, Gulf of Mexico	5	1,539	1	5,100 7,700	34	Naph.	Barge
Crowley (North), Acadia	12	1,912	1	7,100, 8,100	36	Para.	Standard of La.
Darrow, Ascension	10	3,227	1	4,025-7,000	29.1-41	Naph., Para.	Barge
DeLarge, Terrebonne	1	96	1	13,254-66	47	Para.	Barge
Dog Lake, Terrebonne	4	549	1	6,800-7,100	38-40	Para.	Barge
East Hackberry, Cameron	50	5,967	2	2,500-7,600	24-30	Naph.	Barge
Edgerly, Calcasieu	14	165	0	2,525-4,250	17-35	Naph.	Gulf
Elton (South), Jefferson Davis	1	17	0	8,955-65	51	Para.	Barge
Eola, Avoyelles	3	320	4	8,445-8,550 1,520-2,100 2,725-4,550	43 20-22 26-30	Para.	Continental
Evangeline (Jennings), Acadia	142	27,169	5	5,000-8,200	33-40	Naph., Para.	Continental; Standard of La.
Fausse Point, Iberia	1	27	1	1,100, 6,300, 7,900	34	Para.	Barge
Garden Island, Plaquemines	8	1,267	0	4,000-6,800	37-45	Para.	Texas; barge
Gibson, Terrebonne	13	2,970	1	9,400-9,500	37	Para.	Barge
Gillis, Calcasieu	60	6,287	1	5,200-7,500	30-42	Naph., Para.	Union Sulphur; barge
Golden Meadows, La Fourche	1	147	2	8,500-20	37.4	Para.	Barge
Guedan, Vermilion	5	427	0	3,500-4,300	27-30	Naph.	Pure; barge
Gueydan (West), Vermilion	1	159	0	7,100	62	Para.	Pure; barge
Hester, St. James	1	139	1	6,358-64	41	Para.	Barge
Horseshoe Bayou, St. Mary	2	567	1	10,800-900	37	Para.	Barge
Iowa, Jefferson Davis	51	12,950	0	4,400-7,000	24-42	Para., Naph.	Shell; Magnolia
Jeanerette, St. Mary	23	6,287	1	6,600-10,400	34-41	Para.	Standard of La.
Jefferson Island, Iberia	1	194	2	7,800, 8,100	37	Para.	Barge
Lafitte, Jefferson	28	14,980	1	8,000-10,200	33-42	Para.	Texas
Lake Barre, Terrebonne	26	1,309	1	3,600-4,000, 6,100 3,100, 5,110	28-35 32-37	Naph.	Barge
Lake Hermitage, Plaquemines	1	161	0	8,700	Distillate	Para.	Barge
Lake Long, La Fourche	6	1,267	0	9,300, 10,400	38-51	Para.	Barge
Lake Pelto, Terrebonne	7	1,039	1	5,400-6,600	36-40	Para.	Barge
Lake Washington, Plaquemines	7	546	0	1,100, 6,300	24	Naph.	Barge
Leeville, La Fourche	85	4,129	0	2,900-8,400	23-41	Para., Naph.	Barge
Lirette, Terrebonne	2	13	1	8,400, 10,500	Distillate	Para.	Barge
Lockport, Calcasieu	21	1,229	1	2,200-6,900	36-42	Para.	Barge
New Iberia, Iberia	48	14,446	9	2,300-6,700	22-32	Naph.	Standard of La.; barge
Port Barre, St. Landry	30	1,179	1	3,125-4,860 688-96	21-36 16	Naph.	Standard of La.; Texas
Potash, Plaquemines	1	161	1	8,065-70	23	Naph.	Barge
Quarantine Bay, Plaquemines	5	1,856	2	8,100-200	36	Para.	Barge
Raceland, La Fourche	2	1,547	0	7,100, 10,200	34	Para.	Barge
Roanoke, Jefferson Davis	25	2,649	1	7,500-8,725 8,500, 9,800	37-45	Para.	Standard of La.; Shell
Roanoke (South), Jefferson Davis	3	567	1	10,000	47-52	Para.	None
Sorrento, Ascension	6	487	0	1,600-4,300, 5,700	21-32	Naph.	Tank cars
South Houma, Terrebonne	1	228	1	10,300	36	Para.	Barge
South Jennings, Jefferson Davis	2	42	0	8,600 800-1,400	52 18	Para.	None
Starks, Calcasieu	20	454	0	3,000-4,300	31	Para., Naph.	Gulf
St. Martinsville, St. Martin	2	637	0	5,500	32	Para.	Barge
Sulphur, Calcasieu	63	3,987	3	2,600-5,125	21-36	Naph., Para.	Union Sulphur; Gulf; barge
Sweet Lake, Cameron	7	1,157	0	4,400-7,300	28	Naph.	Barge
Tepetate, Acadia	53	5,560	0	8,300, 9,100	33-45	Para.	Continental
Tepetate (Northwest), Acadia	2	157	2	7,960, 8,400	55.4	Para.	Continental
Timbalier Bay, La Fourche	1	169	1	6,950	32	Para.	Barge
University, East Baton Rouge	6	1,659	2	6,400	33.2	Para.	Barge
Valentine, La Fourche	22	4,170	2	3,700-9,200 3,500, 5,600	32-38	Para.	Barge
Venice, Plaquemines	5	1,239	1	7,100	38-40	Para.	Barge
Villa Platte, Evangeline	39	7,329	5	8,925-9,060	41	Para.	Continental
Vinton, Calcasieu	73	1,369	1	1,850-3,950	19.7-33	Naph., Para.	Gulf
Welsh, Jefferson Davis	14	29	0	1,025-3,050	18-21	Naph.	Trucks, tank cars
West Hackberry, Cameron	59	3,684	5	2,925-6,800	21-38	Naph., Para.	Barge
West Lake Verret, St. Martin	2	408	1	8,000	38	Para.	Barge
White Castle, Iberville	8	1,904	0	5,100-8,900	24.2	Naph.	Barge
Woodlawn, Jefferson Davis	4	1,046	3	8,200-8,900	36-51	Para.	Union Sulphur
Total Louisiana Gulf Coast	1,339	196,529	94				
Grand total Gulf Coast	11,631	555,175	320				
Average daily production per well, 47.73 bbls.							

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Natural Gasoline Operations on Gulf Coast Increasing

Natural gasoline manufacture is a phase of operation that until relatively recent years has been little known on the Gulf Coast. However, with the development of an increasing number of large gas-producing fields, gasoline plant operations in the district are being expanded rapidly. Importance of the Gulf Coast in this phase of operation is being substantially boosted.

This district now has a total of 24 gasoline plants in actual operation. Two others are under construction with completion expected in the near future. Construction of still two more will be started soon, while a half dozen others are definitely under consideration. In view of the fact that less than 10 years ago there was not a plant on the Gulf Coast, these are of particular significance.

It was not until 1930 that the first gasoline plant was built on the Gulf Coast. This plant was built by Humble Oil & Refining Co. in the Raccoon Bend field, Austin County, in connection with the repressuring project. The next year the plant now operated by United Gas Pipe Line Co. was built in the Refugio field, Refugio County.

During 1933 two additional plants were placed in operation, one at Refugio and the other at Conroe, Montgomery County, and in 1934 four others were added to the list. Still no particular impetus had been given to gasoline plant operations, and it was not until 1936 that installation of any more plants was undertaken.

With only eight plants having been built up to that time, major expansion of gasoline plant operations in the district has come within the last three years. In this period, as indicated, 17 of the 24 plants now operating have been built, which with the two installations now nearing completion and two others definitely to be started soon, make a total of 21 plants since 1936.

Plants now under construction are those of Continental Oil Co. at Villa Platte, Evangeline Parish, coastal Louisiana, and Stanolind Oil & Gas Co. at Luby, Nueces County, lower Texas Gulf Coast. The former is being built in conjunction with a repressuring project which Continental recently placed in operation in that field. Del Rey Gasoline Co. has completed plans for two plants, one for the Fairbanks field, Harris County, and the other for the Hardin field, Liberty County. Construction will be started shortly.

As recently as 1930 and 1931 there were no fields on the Gulf Coast, except those few in the extreme South Texas area, with any sizable gas production. Since, however, with the advent of the more deeply seated types of fields producing from the Marginulina, Frio, Vicksburg, Cockfield and lower horizons, with their more consistent sand conditions, the situation has been materially altered, as reflected in the building of gasoline plants. In most of these newer fields, gas figures prominently in the production, and large reserves are being proved. Also, development of more efficient recovery methods is making possible installation of gasoline plants where before such installations might not have been feasible.

In the development of gas recycling and repressuring practices for producing the high-pressure gas-distillate type of field which has come to the front recently on the Gulf Coast, the way is being opened for further important expansion of gasoline plant operation in the district. Although in many instances, operators may not see fit to provide complete gasoline plant facilities for extraction of the distillate content in gas to be recycled, it is highly probable that in many of these recycling projects to be undertaken, conventional gasoline plants will be installed.

Such a plant has just been placed in operation by Agua Dulce Corp. in conjunction with recycling and repressuring operations which this company is undertaking in the Agua Dulce field, Nueces County, Texas. This plant designed to process 60,000,000 cu. ft. of gas daily and equipped to produce not only natural gasoline, but also motor fuel, naphtha, kerosene or gas oil, operates at absorbing pressures up to 1,200 pounds, an important factor in economical repressuring work. This pressure minimizes the pressure drop of the gas between the wells and the compressors, which reduces compressor requirements. A complete description of this plant appeared in a recent issue of The Oil and Gas Journal. High-pressure absorption may be the determining factor in installation of gasoline plants with repressuring projects.

The largest gasoline plant on the coast is that

(Continued on Page 111)

GASOLINE PLANTS ON GULF COAST

Texas

Company—	Field	County	Year built	Daily capacity—Gas (ft.)	Daily capacity—Gasoline (gallons)	Type plant
Agua Dulce Corp.	Agua Dulce	Nueces	1939	60,000,000	30,000	Absp.
B-W Gasoline Co.	Livingston	Polk	1937	10,000,000	5,000	Absp.
Clymore Co., Inc.	Refugio	Refugio	1933	50,000,000	30,000	Absp.
Danciger O. & R. Inc.	Pledger	Brazoria	1934	60,000,000	40,000	Absp.
Del Ray Gasoline Co.	Sandy Point	Brazoria	1938	20,000,000	10,000	Absp.
Duval Gasoline Co.	Benavides	Duval	1938	9,000,000	20,000	Ref.
Hamman Exploration Co.	Bay City	Matagorda	1938	40,000,000	15,000	Absp.
Humble O. & R. Co.	Conroe	Montgomery	1934	15,000,000	27,000	Absp.
Humble O. & R. Co.	Dickinson	Galveston	1937	15,000,000	13,000	Absp.
Humble O. & R. Co.	Flour Bluff	Nueces	1937	15,000,000	15,000	Absp.
Humble O. & R. Co.	Heyser	Calhoun	1937	25,000,000	25,000	Absp.
Humble O. & R. Co.	Raccoon Bend	Austin	1930	15,000,000	12,000	Absp.
Humble O. & R. Co.	Tomball	Harris	1937	35,000,000	30,000	Absp.
Manhattan Gasoline Co.	Plymouth	San Patricio	1936	50,000,000	30,000	Absp.
Midland Gasoline Co.	Conroe	Montgomery	1933	30,000,000	20,000	Absp.
Natural Gasoline Corp.	McCampbell	Aransas	1938	110,000,000	65,000	Absp.
Refugio Refineries, Inc.	La Blanca	Hildalgo	1937	25,000,000	10,000	Comb. ref Absp. gaso.
Southern Minerals, Inc.	Saxet	Nueces	1937	50,000,000	25,000	Absp.
Stanolind O. & G. Co.	Luby	Nueces	*			Absp.
United Gas P. L. Co.	Agua Dulce	Nueces	1934	60,000,000	45,000	Absp.
United Gas P. L. Co.	Refugio	Refugio	1931	50,000,000	25,000	Absp.
Total capacity				750,000,000	492,000	

Louisiana

Company—	Field	Parish	Year built	Daily capacity—Gas (ft.)	Daily capacity—Gasoline (gallons)	Type plant
Continental Oil Co.	Gillis	Calcasieu	1937	10,000,000	5,000	Absp.
Continental Oil Co.	Tepetate	Acadia	1936	25,000,000	20,000	Absp.
Continental Oil Co.	Villa Platte	Evangeline	*	20,000,000	15,000	Absp.
Shell Petroleum Corp.	Iowa	Jefferson Davis	1934	15,000,000	15,000	Absp.
The Texas Co.	Lafitte	Jefferson	1937	10,000,000	5,000	Absp.
Total capacity				80,000,000	60,000	

*Under construction.

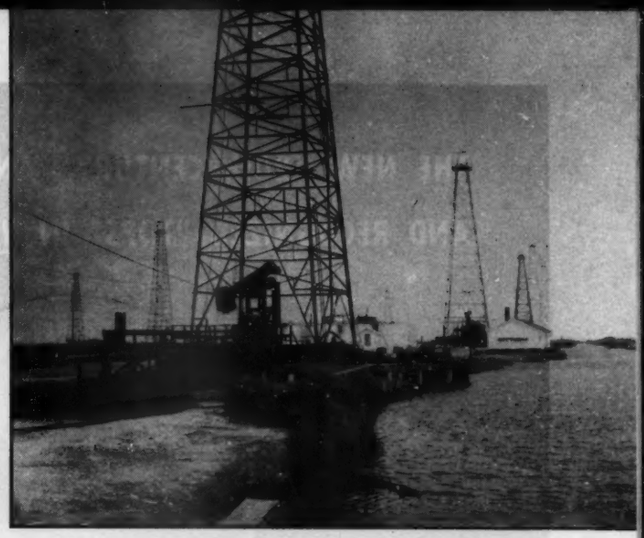
PLANTS ERECTED ON GULF COAST BY YEARS

Year—	No. plants
1930	1
1931	1
1933	2
1934	4
1936	2
1937	9
1938	4
1939	*3
Total	26

*Two under construction.

Hamman Exploration Co. gasoline plant at Bay City, Matagorda County, Texas Gulf Coast. (Picture taken by light of flare)

No Limit Yet to Deeper Drilling in the Gulf Coast



New Iberia field, coastal Louisiana

By NEIL WILLIAMS

Capability of modern drilling equipment and practices to keep pace with the growing requirements imposed by deeper exploration and development is shown by the extent to which lower horizons are being exploited on the Gulf Coast. So far it is evident the point of mechanical or physical limitation of deeper drilling has not been reached. Consistently, greater depths are being penetrated, and in turn general development at these successively lower levels is becoming more widespread.

Deep drilling has become practically synonymous with Gulf Coast exploration and development. Although this district does not hold the depth record, this distinction belonging to California, possibly in no other district is the exploitation of lower horizons quite so widespread. In this, wells now are being drilled to 9,000 feet, 10,000 feet, and even lower with the same commonness and facility that development to 5,000 feet and 6,000 feet was carried on a few years ago.

For this development an impressive array of drilling rigs is operating on the Gulf Coast. These represent assemblies of the largest and most modern types of oil field equipment available. In their use, operators have sought to provide the most adequate facilities to expedite drilling to deep horizons. Methods being adopted are making possible much greater efficiency in operation.

The past year has seen drilling on the Gulf Coast extended to new record low levels in this district, with four tests going to depths below 13,000 feet. The deepest was Union Producing Co. No. 1 Minnie Brown, Agua Dulce field, Nueces County, which touched 13,728 feet. With hole at that depth in good condition and facilities adequate, this test could have drilled on but without productive encouragement it was plugged back and completed in a shallow gas sand. Depth of this test is exceeded by two California tests.

One of the 13,000-foot tests, Fohs Oil Co. No. 1 Buckley-Bourg, a wildcat at Bayou DeLarge, Terrebonne Parish, La., was completed as a producing well. Drilled to a total depth 13,333 feet, casing was run to bottom and perforated at a total depth of 13,266 feet, where the well is the deepest producer in the world, although a well just completed in California runs it a close second. It still is the only producer below 13,000 feet on the Gulf Coast. A second test is now being started in this area. Contract was let for 12,000 feet, making the deepest drilling contract ever let. Upon completion of contract, if shallower production is not found, Fohs Oil Co. will deepen.

Fohs Oil Co. No. 1 Bay Baptiste, a wildcat on the Bay Baptiste prospect, south of Lirette, Terrebonne Parish, another of the 13,000-foot tests, made a 11,000-foot producer, plugging back from a total depth of 13,409 feet and perforating casing in sand at 11,178 feet. This well, still the only test drilled on that prospect is about 15 miles from the Buckley-Bourg well.

Friendswood field, Harris County, Texas

The other 13,000-foot test was Stanolind Oil & Gas Co. No. 3 Calcasieu, at South Elton, Jefferson Davis Parish, coastal Louisiana, which was drilled to 13,210 feet, where it was abandoned, although it encountered considerable gas.

Altogether, 174 tests on the Gulf Coast have been drilled below 10,000 feet. Of these, four are 13,000-foot tests. Besides these nine tests have been drilled below 12,000 feet, 30 others below 11,000 feet, with the remainder, 131, being 10,000-foot tests. All have been drilled since 1934, the year in which the first 10,000-foot test was recorded.

TOTAL TESTS DRILLED BELOW 10,000 FEET ON GULF COAST BY YEARS

Depth—	*1939	1938	1937	1936	1935	1934	Total
Below 13,000 ft.	1	3	0	0	0	0	4
12,000-13,000 ft.	2	2	5	0	0	0	9
11,000-12,000 ft.	7	20	3	0	0	0	30
10,000-11,000 ft.	30	63	31	2	4	1	131
Total	40	88	39	2	4	1	174

*Includes tests drilling.

The trend toward deeper drilling that has been going on in the Gulf Coast is indicated in an accompanying tabulation. The first 10,000-foot test, completed in 1934 was followed by completion of four others in 1935. Only two more were added in 1936, but in 1937 deep drilling really got in sway. In that year, 39 additional tests were drilled to depths below 10,000 feet, including five tests drilled below 12,000 feet and three others below 11,000 feet. The next year the list was nearly doubled with 25 tests going below 11,000 feet. In 1938 the first 13,000-foot tests were drilled. So far this year, more than 40 tests either have been completed at depths below 10,000 feet or are drilling at these levels.

Along with deeper exploration, productive depths also are steadily being lowered. First production below 10,000 feet, which was in the Lafitte and Old Ocean fields of Jefferson Parish, La., and Brazoria County, Texas, respectively, was not opened until early in 1937. There now are 62 such wells, repreesnting 14 different fields. Lafitte and Old Ocean account for most of these wells with the other fields having had only limited development. Except the one 13,000-foot well at Bayou DeLarge, and two 11,000-foot wells, one at Bay Baptiste and the other at Lirette, all are confined to the 10,000-foot level, although various tests drilled below 11,000 feet in these and other areas have given definite indications of productions in the lower horizons. According to a late report, fields with production below 10,000 feet are shown in the accompanying table.

Prospects for another 11,000-foot field are seen in Vendome Petroleum Corp. No. 1 Kenilworth plantation, near Poydras, St. Bernard Parish, La., about 25 miles down the Mississippi River from New Orleans. This well, drilled to a total depth of 11,469 feet, flowed 480 bbls. of fluid, 60 per cent oil, from a series of sands down to depths below 10,736 feet. It was not completed at this writing.

The widespread nature of the deep exploration under way on the Gulf Coast is indicated in the fact that the 174 wells which have been drilled below 10,000 feet have been scattered over 75 different fields and areas. Only in Lafitte and Old Ocean has there been any concentration of drilling, 27 wells having been put down in the former and 29 in the latter. Thirty-three different fields and areas are represented in 43 tests that have been drilled to depths below 11,000 feet.

With commercial production at these depths already proved in at least 14 fields, continued de-

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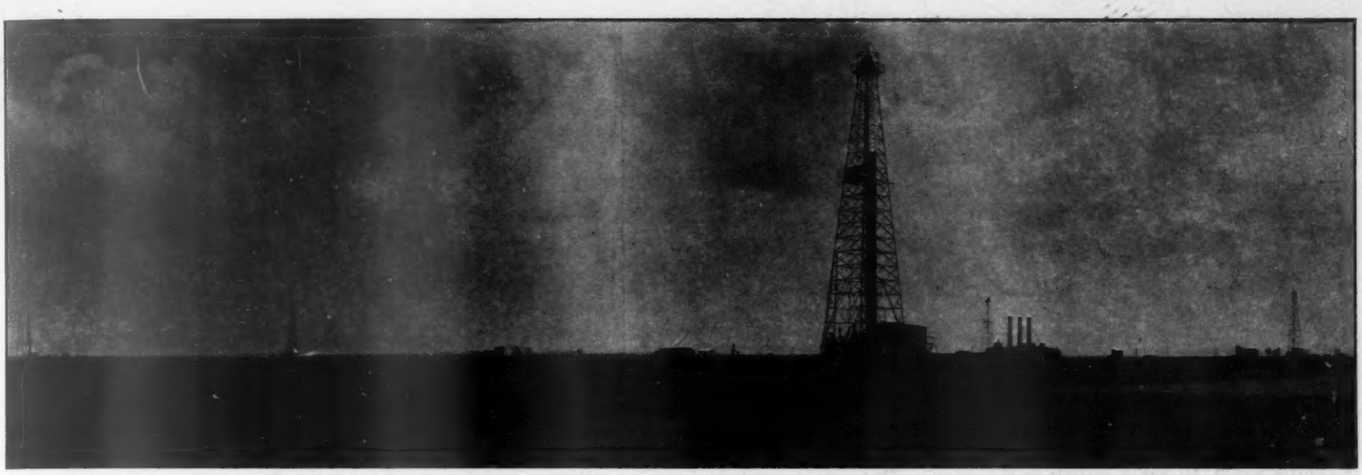


League City field, Galveston County

velopment is assured in most of these areas, and with extension of deeper drilling to other fields and areas, the present deep wells represent only a small part of deep development to be done.

Extension of drilling to depths of 14,000 feet and below is expected to be a matter of only a short time. Two tests in California already have gone to that depth, one to 15,000 feet, so that, mechanically and physically, drilling to such depths is possible. Although the deepest test drilled on the Gulf Coast did not reach 14,000 feet, it lacked only 272 feet, and easily could have been carried on if operators had desired. Several tests now drilling have been started with a view to drilling to such depths.

Coastal Louisiana leads in deep drilling as indicated by the fact that 116 of the tests drilled below 10,000 feet on the Gulf Coast have been in that district. Of the 43 tests drilled below 11,000 feet, 38 have been on the Louisiana side of the line. Of the 49 different fields and areas in which 10,000-foot tests have been drilled, 49 have been in Louisiana, and of the 33 areas in which 11,000-foot tests have been drilled 19 are in that district.

PRODUCING WELLS BELOW 10,000 FEET BY FIELDS

Field, *County or Parish	Total tests below 10,000 ft.	Producing wells below 13,000 ft.	Producing wells below 12,000 ft.	Producing wells below 11,000 ft.	Producing wells below 10,000 ft.
Bay Baptiste, Terrebonne (L)	1	0	0	1	0
Bayou Delarge, Terrebonne (L)	1	1	0	0	0
Golden Meadows, Lafourche (L)	3	0	0	0	1
Horseshoe Bayou, St. Mary (L)	3	0	0	0	2
Jeanerette, St. Mary (L)	6	0	0	0	1
Lafitte, Jefferson (L)	27	0	0	0	22
Lake Long, Lafourche (L)	4	0	0	0	2
Lirette, Terrebonne (L)	6	0	0	†	0
North Crowley, Acadia (L)	1	0	0	0	1
Old Ocean, Brazoria (T)	29	0	0	0	25
Raceland, Lafourche (L)	7	0	0	0	2
Saxet, Nueces (T)	1	0	0	0	1
South Roanoke, Jeff. Davis (L)	2	0	0	0	1
Wax Lake, St. Mary (L)	2	0	0	0	1
Total	93	1	0	2	59

*(L) Louisiana; (T) Texas. †Since completion well plugged to shallower sand.

WELLS DRILLED BELOW 11,000 FEET IN SOUTH TEXAS AND COASTAL LOUISIANA

Company—	Field or Area	County or Parish	Total depth	Comp. depth	Date comp.	Remarks
Union Producing Co., 1 Minnie Brown	Agua Dulce	Nueces (T)	13,728	4,603	2-39	Gas well
Fohs Oil Co., 1 Bay Baptiste	Bay Baptiste	Terrebonne (L)	13,409	11,178	8-38	Producer
Fohs Oil Co., 1 Buckley & Bourg	DeLarge	Terrebonne (L)	13,333	13,266	7-38	Producer
Stanolind Oil & Gas Co., 3-B Calcasieu	South Elton	Jeff Davis (L)	13,210	.....	6-38	Abandoned
The Texas Co., 2 State	Horseshoe Bayou	St. Mary (L)	12,768	.....	...	Active
The Texas Co., 1 Continental	Wildcat	Terrebonne (L)	12,483	.....	2-39	Abandoned
The Texas Co., 1 State	Horseshoe Bayou	St. Mary (L)	12,261	10,873	8-37	Producer
Continental Oil Co., 1 C. C. Hebert	Abbeyville	Vermilion (L)	12,216	7,682	2-37	Producer
Amerada Petroleum Corp., 2 South Coast	Raceland	Lafourche (L)	12,200	.....	11-38	Abandoned
Humble O. & R. Co., 1 H. S. Ellender	Lirette	Terrebonne (L)	12,168	11,615	5-37	Producer
Stanolind Oil & Gas Co., 1 Stovall	South Abbeville	Vermilion (L)	12,133	.....	2-37	Abandoned
The Texas Co., 1 Bayou Norman	Lafitte	Jefferson (L)	12,115	9,630	11-37	Producer
Continental Oil Co., 1 Joe Sturdivant	South Roanoke	Jeff Davis (L)	12,088	9,880	10-38	Producer
The Texas Co., 1 School Board	Lafitte	Jefferson (L)	11,961	.....	2-39	Abandoned
Humble O. & R. Co., 1 Milliken & Farewell	Wildcat	Assumption (L)	11,960	.....	3-39	Abandoned
Union Producing Co., 1 Fudenburk	Lirette	Terrebonne (L)	11,933	.....	6-38	Abandoned
Continental Oil Co., 1 Brookshire	Abbeville	Vermilion (L)	11,909	7,890	11-37	Producer
The Texas Co., 1 Bateman Lake	Wax Lake	St. Mary (L)	11,879	10,905	12-37	Producer
The Texas Co., 5 State	Fausse Point	Iberia (L)	11,780	.....	....	Active
Humble O. & R. Co., 1 Robt. Veret	Lirette	Terrebonne (L)	11,767	8,460	10-38	Producer
Union Sulphur Co., 3 Miami Corp.	Wildcat	Cameron (L)	11,693	.....	10-38	Abandoned
Humble O. & R. Co., 2 Hanszen	Chalkely	Cameron (L)	11,693	8,568	11-38	Gas well
Humble O. & R. Co., 1 Laterre	Lirette	Terrebonne (L)	11,680	8,455	1-39	Gas well
Herton Oil Co., 1 Teche Sugar Co.	Jeanerette	St. Mary (L)	11,634	.....	2-38	Abandoned
Continental Oil Co., 2 Robbins	Citrus Grove	Matagorda (T)	11,612	.....	5-37	Abandoned
Vendome Pet. Corp., 1 Kenilworth	Wildcat	St. Bernard (L)	11,467	.....	...	Active
Skelly Oil Co., 14-B Cobb	Van Vleck	Matagorda (T)	11,465	7,469	2-38	Producer
Humble O. & R. Co., 1 Wurzlow	Lirette	Terrebonne (L)	11,347	.....	2-38	Abandoned
Fohs Oil Co., 3 State	Lake Long	Lafourche (L)	11,347	9,382	2-38	Producer
Sun Oil Co., 1 Bayshore Farms	Palacios	Matagorda (T)	11,327	9,261	10-38	Producer
Amerada Petroleum Corp., 1 Godchaux Sugars	Raceland	Lafourche (L)	11,312	.....	11-38	Temp.abandoned
Herton Oil Co., 1 Thistlephlite	Wildcat	St. Landry (L)	11,220	.....	11-38	Abandoned
Shell Petroleum Corp., 1-C Realty Operators	Wildcat	Terrebonne (L)	11,208	.....	8-38	Abandoned
The Texas Co., 1 Wax Bayou	Wax Lake	St. Mary (L)	11,185	8,660	12-38	Producer
W. T. Burton, 1 State-Lake Pontchatrain	Wildcat	Orleans (L)	11,149	.....	2-38	Abandoned
Harrison & Abercrombie, 1 Copeland	Old Ocean	Brazoria (T)	11,136	10,677	1-38	Producer
The Texas Co., 1 Laterre	Golden Meadows	Lafourche (L)	11,135	8,820	12-38	Producer
Amerada Pet. Corp., 2 Godchaux	Raceland	Lafourche (L)	11,114	.....	2-39	Abandoned
Stanolind O. & G. Co., 1 Freeman	Katy	Waller (T)	11,080	7,385	8-38	Gas well
The Texas Co., 1 St. Mary Land Co.	Horseshoe Bayou	St. Mary (L)	11,067	10,909	12-38	Producer
Gulf Oil Corp., 4 Q. Q. State	Quarantine Bay	Plaquemines (L)	11,014	8,149	10-38	Producer
Shell Petroleum Corp., 1 Godchaux	Wildcat	St. John the Baptist (L)	11,005	.....	11-38	Abandoned
Shell Petroleum Corp., 2 Peters	South Houma	Terrebonne (L)	11,001	.....	3-39	Abandoned

*(T) Counties in Texas; (L) Parishes in Louisiana.

Gulf Coast District Center of World Oil Refining

The Gulf Coast of Texas and Louisiana extending from Mexico to Mississippi is constantly strengthening its position as the largest refining area in the United States and the entire world. Its rapid growth as the manufacturing center got under way in the early twenties and its expansion over the past years has been outstanding.

Previous to 1920 the refining capacity of the Gulf Coast represented less than 15 per cent of the total in United States. In the early thirties, due largely to the enlargement of a few plants, the percentage increased to 25. In 1935 the crude runs to stills of its refineries represented 25.2 per cent of the total; 1936, 26.1 per cent; 1937, 28.1 per cent; 1938, 30.1 per cent, and January of this year, 31.8 per cent. Should this comparative trend continue, the Gulf refineries by 1941 will represent one-third of the refining industry in this country.

The following table, based on Bureau of Mines report for January 1939, shows the crude runs to stills and output of refinery products in the United States compared to the Texas and Louisiana Gulf Coast (data in thousands of barrels):

	Total U. S.	Gulf Coast	Per cent of total
Crude to stills	99,614	31,665	31.8
Gasoline	48,308	14,160	29.3
Kerosene	5,702	2,838	49.7
Gas oil and distillate	14,135	5,255	37.1
Fuel oil	25,800	7,625	24.9
Lubricants	2,527	674	26.6
Wax (pounds)	35,280	6,720	19.0
Coke (tons)	126	22	17.4
Asphalt	244	30	12.0

The 40 operating refineries in the Texas Gulf Coast* and the four operating plants in the Louisiana Gulf Coast* have a crude oil capacity of 1,129,550 bbls. daily. They vary in size from topping plants handling less than 1,000 bbls. of crude oil daily to the complete refineries processing more than 100,000 bbls. of crude oil daily. The largest Texas plants and their daily crude oil capacity are: Texas Co., Port Arthur, 125,000; Sinclair Refining Co., Houston, 55,000; Pure Oil Co., Smiths Bluff, 44,000 Pan American Refining Corp., 79,000; Magnolia Petroleum Co., 100,000; Humble Oil & Refining Co., 137,000, and Gulf Oil Corp., 115,000. In Louisiana, the Standard Oil Co. of Louisiana has a 100,000-bbl. plant at Baton Rouge.

With the exception of the Pan American refinery, which was built in 1935, these large plants have been in operation continuously for many years. All started as small plants and have been gradually expanded to their present capacities. There are a number of smaller refineries which have been operating 15 or more years. Over the past five years a number of new plants have been built, particularly in the Corpus Christi area. The rapid growth of crude oil production coming from new fields in the Corpus Christi area, which is part of the section generally known as Southwest Texas, has justified new refinery construction. Plants have been built there both by large companies and small independent concerns.

Crude Supply

The Gulf Coast plants, which today are refining more than 1,000,000 bbls. of crude daily into finished products, draw on a large area for their crude oil supplies. Major pipe line systems extend to practically all the principal producing fields of Louisiana, Texas and New Mexico. The combined production of the three states is now 1,700,000 bbls. daily. These pipe lines not only supply the Gulf Coast refineries but also furnish approximately 450,000 bbls. of crude oil daily to plants located along the Atlantic seaboard, and about 100,000 bbls. daily to foreign plants. This coastwise and export crude is shipped from Gulf Coast terminals. In addition to the three states named, small quantities of crude oil are obtained from Oklahoma and Arkansas.

These pipe lines furnish a wide variety of crude oils and this is one of the reasons for the steady increase in Gulf Coast refinery operations. Large pipe line systems can secure the grade of crude oil best suited to the various refinery operations. The crudes range from the low gravity, high sulfur, sour crudes of some of the West Texas fields to high gravity, sweet distillates. Several of the Gulf Coast crudes are particularly suitable for the production of naphthenic base lubricants. Other Texas and Louisiana crudes are used in the manufacture of paraffin base lubricants.

The completeness of the Gulf Coast refinery operations and the variety of crudes with which the plants operate is reflected in the type of equipment. Practically every method of processing which has reached the commercial stage will be found at one or more of the Gulf Coast plants. Some of the largest combination topping and cracking units are in operation. Most of the plants above 10,000 bbls. capacity have well-balanced cracking facilities which explains that more than 30 per cent of all the cracked gasoline in the United States comes from the Gulf refineries. A number of polymerization and reforming plants are in operation and two hydrogenation units are utilized in the production of high octane material used in blending aviation grade gasolines. Refiners, in addition to their share of the domestic business, supply important foreign markets with aviation grade gasolines. In this connection a substantial part of the Mid-Continent production of natural gasoline is absorbed by Gulf refineries as blending material.

Large Kerosene Yield

As shown in the foregoing table, Gulf companies refine almost 50 per cent of the kerosene produced in this country. These refineries supply better than 75 per cent of the kerosene exports from this country. The large quantities of East Texas crude processed at the Gulf plants account in part for the kerosene production. The East Texas crude gives a large yield of kerosene by natural distillation and the kerosene is of exceptionally high quality which has found favor with many foreign customers.

The Atlantic seaboard markets and those of the southeastern states absorb a large percentage of the Gulf refinery output. The refineries located alond the East Coast do not supply all the markets of the seaboard states and Gulf Coast products are regularly shipped to distributing terminals extending from Florida to Maine. Over the past three years there has been an increasing quantity of products moved up the Mississippi and Ohio rivers to inland water terminals. The Gulf re-

Taylor Refining Co., Corpus Christi, Texas

*Name of company, location, and capacity listed by plants on Gulf Coast map inserted in this issue.

fineries are now by far the largest suppliers of bunker fuels for the marine and industrial trades. The shipments of heavy fuels average more than 250,000 bbls. daily. More than 40 per cent of all the gas oil and overhead distillates consumed in this country come from the Gulf Coast refiners. Most of the domestic shipments go to eastern markets.

Formerly the production of Gulf Coast lubricants was confined to overhead neutrals manufactured from naphthenic base grade crudes. In recent years several plants have installed facilities to manufacture the western bright stocks and the paraffin neutrals and now Pennsylvania grade stocks are refined into finished oils at two plants. The result is that the refineries are now in a position to manufacture practically any grade lubricants required by domestic and export markets. Several large solvent refining plants have been installed over the past five years.

World Wide Distribution

Ships flying many flags from all parts of the world can be seen at the water terminals of the Gulf Coast. No refining area has a wider distribution of its petroleum products with the possible exception of plants located in the Dutch West Indies.

Gasoline, kerosene, and fuel oils are shipped regularly to several countries and during the course of the year Gulf Coast refinery products are consumed in more than 50 countries. The following tables, based on 1938 shipments, were prepared by the Bureau of Foreign and Domestic Commerce, Department of Commerce, to show the foreign distribution from the three principal shipping points:

GASOLINE IN BULK

(Barrels)

Country—	N. Orleans	Sabine	Galveston
United Kingdom	269,865	1,602,440	3,303,112
Cuba	44,270	.....	597,730
Netherlands W. Indies	359,143	181,712	76,719
France	11,549	735,609	1,682,647
Belgium	.....	807,433	233,897
Netherlands	.....	548,010	993,923
Spain	.....	1,981,856	.....
Brazil	15,271	1,096,470	65,953
Uruguay	.....	113,589	.....
Denmark	22,597	280,231	186,755
Germany	455,769	176,686	966,214
Sweden	82,989	978,285	1,178,259
Peru	17,249	.....	5,778
Haiti	.....	.....	11,755
Panama Canal Zone	140,983	.....	.....
Switzerland	.....	.....	69,671
Ireland	.....	176,852	.....
Portugal	.....	120,951	44,454
British East Africa	.....	15,760	.....
Union of South Africa	.....	569,231	.....
Other Spanish Africa	.....	101,386	.....
Czechoslovakia	.....	.....	45,210
Norway	.....	.....	263,196
Algeria and Tunisia	.....	.....	9,441
Italy	349,558	.....	69,564
Latvia	.....	2,605	.....
Canada	.....	192,382	716,004
Finland	.....	.....	267,173
Japan	.....	.....	54,838
Morocco	.....	.....	26,371
Guatemala	252	24,294	.....
Kwantung	.....	.....	76,848
Argentina	.....	.....	24,718
Turkey	.....	.....	18,144

GAS OIL AND DISTILLATE FUEL OIL

(Barrels)

Country—	N. Orleans	Sabine	Galveston
Norway	253,265	.....	149,059
Sweden	7,590	127,840	305,215
United Kingdom	1,342,202	246,148	1,618,279
British Honduras	5,350	2,067	.....
Guatemala	3,814	1,254	.....
Honduras	8,695	810	.....
Mexico	16,078	.....	.....
Surinam	8,398	.....	.....
Nicaragua	6,992	.....	4,070
Belgium	.....	761,637	253,018
Netherlands	665,463	112,368	1,274,729
Brazil	171,464	78,222	181,646
Australia	.....	9,440	.....
New Zealand	.....	4,792	.....
British East Africa	.....	3,196	.....
Union of South Africa	.....	21,527	56,371
Other French Africa	.....	4,244	.....
Mozambique	.....	14,211	.....
Other part Africa	.....	1,523	.....
Canary Island	.....	33,514	.....
Denmark	.....	212,764	505,405
Germany	.....	494,690	3,109,275
Portugal	.....	.....	3,229
Netherlands W. Indies	700,994	.....	1,186,040
France	.....	.....	45,582
Ireland	.....	15,755	.....
Panama Canal Zone	.....	123,542	73,473
Other Spanish Africa	.....	195,204	.....
Cuba	.....	.....	117,349
Netherlands Indies	.....	.....	79,387
Canada	89,485	.....	136,635
Spain	.....	295,083	.....
Poland and Danzig	.....	.....	48,205
Switzerland	.....	.....	169,961
Morocco	.....	.....	20,072
Syria	.....	.....	16,806
Greece	.....	.....	15,352
Turkey	.....	.....	51,359
Finland	.....	.....	13,075

NATURAL GASOLINE

(Barrels)

Country—	N. Orleans	Sabine	Galveston
Netherlands	.....	.....	294,501
Spain	.....	.....	43,300
Netherlands W. Indies	.....	.....	1,799,634
Nicaragua	69	.....	.....
France	.....	12,935	343,675
United Kingdom	.....	.....	1,215,791
Cuba	377	.....	.....
British Malaya	.....	.....	204,401
Belgium	.....	8,003	15,375
Canada	.....	15,080	275,400
Italy	.....	.....	4,251

RESIDUAL FUEL OIL

(Barrels)

Country—	N. Orleans	Sabine	Galveston
Belgium	.....	25,285	.....
Italy	.....	127,712	959,076
Netherlands	.....	721,873	80,360
Spain	.....	230,861	.....
Honduras	67,500	.....	.....
Nicaragua	14,800	.....	.....
Cuba	1,609	48,345	1,306,080
Surinam	42,786	.....	.....
Morocco	.....	48,023	136,097
Panama Canal Zone	.....	209,240	203,417
Mexico	12,500	.....	.....
Other Spanish Africa	.....	428,121	.....
Poland and Danzig	.....	21,314	.....
United Kingdom	48,000	282,540	54,820
Guatemala	.....	.....	60,370
Portugal	.....	.....	95,208
Canada	75,740	.....	.....
Egypt	.....	.....	49,121
Other French Africa	.....	58,775	75,477
Gibraltar	.....	.....	33,349
France	.....	.....	57,694
Other Portuguese Africa	.....	16,203	54,008
Greece	30,739	.....	.....
Norway	.....	22,351	.....
British Guiana	2,000	.....	.....
Brazil	.....	.....	48,320

CRUDE PETROLEUM

(Barrels)

Country—	N. Orleans	Sabine	Galveston
France	107,692	4,067,396	4,467,260
Germany	343,763	754,596	35,089
Italy	81,196	4,122,458	859,962
Netherlands	.....	67,407	.....
Cuba	.....	369,835	272,241
Sweden	69,783	.....	67,364
Honduras	850	.....	.....
Spain	.....	53,630	.....
Argentina	.....	1,504,261	.....
Canada	539,462	5,254,997	2,699,007
Japan	.....	31,145	45
Brazil	1,045	.....	.....
Czechoslovakia	.....	71,332	.....
Latvia	.....	36,162	.....
Belgium	18,001	.....	73,171
Colombia	.....	63,628	.....
Canary Island	.....	85,098	.....

NATURAL GASOLINE

(Continued from Page 104)

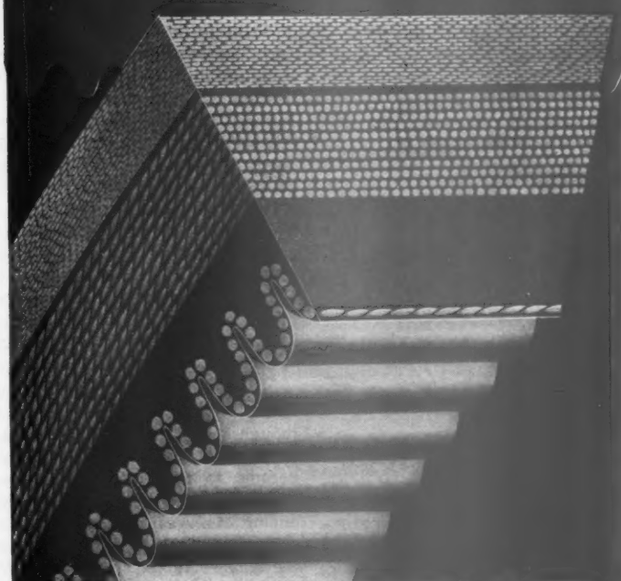
of Natural Gasoline Corp. in the McCampbell field, near Aransas City, Aransas County, Texas. This plant, completed late in 1938, has a maximum capacity of more than 110,000,000 cu. ft. of gas daily, from which on the basis of present percentage of recovery, more than 50,000 gallons of gasoline is produced daily. It has two absorption systems, one for high-pressure gas and the other for low-pressure gas, and also two separate distillation systems. With a high-pressure absorber and the low-pressure absorbers, gas is taken at three different pressures.

Entirely different in principal of operation is Duval Gasoline Co.'s plant in the Benavides field, Duval County. This plant, built in 1938, does not use any absorption, employing a combination of refrigeration and substantially complete dehydration of gases. Additional equipment has just been placed in operation at the plant which has boosted its capacity from 6,000,000 cu. ft. of gas daily, as originally operated, to 9,000,000 cu. ft. This new equipment included a 500-hp. angle type compressor, having three 21-inch cylinders; an additional scrubber; a new water-cooling tower; electrically powered circulating and water pumps, and a new electric power generating plant. Besides the new 500-hp. compressor, the plant has two 400-hp. and one 300-hp. compressors.

So far only four of the plants now in operation on the Gulf Coast are in coastal Louisiana, although with completion of Continental Oil Co.'s new plant at Villa Platte, the number will be boosted to five. Except in those fields where plants now are located, development of gas-producing reserves in coastal Louisiana has been more limited than in Texas which accounts for the smaller number of plants. With further development of this type of field, additional plants no doubt will be built.

Magnolia Petroleum Co. refinery at Beaumont, Texas

DEMAND *Super-Flex* DAYTON COG-BELTS
WITH DAYTEX CORD



Developed as a result of 7 tireless years of tests and research by Dayton's famed technical laboratories, Super-Flex Dayton Cog-Belts with Daytex Cord in their neutral axis section reduce maintenance expense to a minimum never before achieved.

Daytex Cord, steel-like in strength, is made from highest grade long-staple, hard-bodied cotton. In the process of manufacturing, a bonding-compacting agent removes the non-essential oils and waxes from the individual fibres. This causes the fibres to interlock and form a stronger, yet more compact cord.

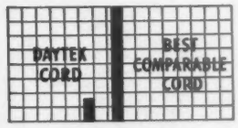
Due to Daytex Processing—Daytex Cord becomes on an average 22% smaller in diameter. It improves in tensile strength, runs cooler, stands up under constant high-speed flexing. Furthermore, it has lower stretch and, due to interlocked fibres, has minimum tendency to become lifeless.

This denser Daytex cord is cooler running because highly developed rubber compounds are forced into and around each individual cord by Dayton's patented Latexing and Calender Process. These processes have been pioneered, and constantly improved by Dayton for 19 years.

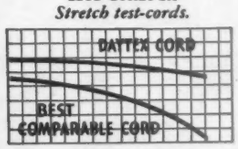
Outstanding in basic design, Super-Flex Dayton V-Belts are built to bend with patented cog construction. They work on short centers—save space—assure you longer life—and reduce adjustments to a negligible minimum. So to step-up *your* production standards—to lower your costs, demand Super-Flex Dayton V-Belts made with Daytex Cord.

THE DAYTON RUBBER MFG. CO., DAYTON, O.

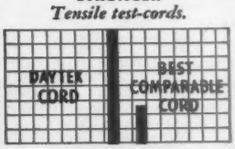
The charts below show results of laboratory tests of Daytex Processed cord versus best comparable cord NOT Daytex Processed.



LESS STRETCH
Stretch test-cords.



STRONGER
Tensile test-cords.



LONGER LIFE
Belt flexing test.

LABORATORY TESTS PROVE THE OUTSTANDING SUPERIORITY OF DAYTEX CORD

Dayton
COG-BELT DRIVES

LUNKENHEIMER SERVES THE OIL INDUSTRY

with a Complete Line for Steam, Water, Air, Gasoline and Oil Service

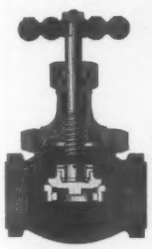


Fig. 1021
150 lb. S.P.
Iron Body "Ferrenewo"

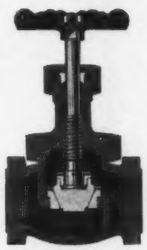


Fig. 1857-P
150 lb. S.P. Plug Type
All-Iron "Ferrenewo"

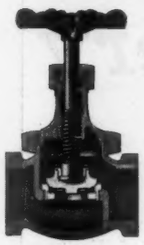


Fig. 73
200 lb. S.P.
Bronze "Renewo"

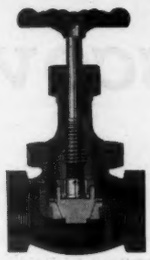


Fig. 16-P
300 lb. S.P. Plug Type
Bronze "Renewo"

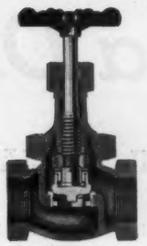


Fig. 1878
350 lb. S.P.
Bronze Globe

Fig. 1720
600 lb. S.P.
Steel Globe

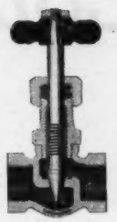


Fig. 906
200 lb. S.P.
Bronze Needle Valve

Fig. 2125
125 lb. S.P.
Double Wedge Disc
Bronze Gate

Fig. 2129
125 lb. S.P.
Single Wedge Disc
Bronze Gate

Fig. 427
150 lb. S.P.
Double Wedge Disc
Bronze Gate

Fig. 1640
150 lb. S.P.
Iron Body
"King-clip" Gate

Fig. 768
200 lb. S.P.
Single Wedge Disc
Bronze Gate

Fig. 1881
350 lb. S.P.
Single Wedge Disc
Bronze Gate

Fig. 1730
3000 lb. W.O.G.
Steel Needle Valve

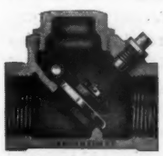


Fig. 554
200 lb. S.P.
Bronze Regrinding
Swing Check

Fig. 1880
350 lb. S.P.
Bronze Regrinding
Swing Check

Fig. 1872-B6
350 lb. S.P.
Steel Globe

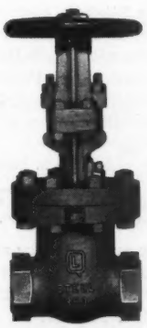


Fig. 1869-B6
350 lb. S.P.
Steel Gate

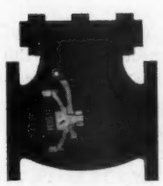


Fig. 1790
125 lb. S.P.
Iron Body Swing Check

Fig. 1123
125 lb. S.P.
Iron Body Globe

Fig. 1430
125 lb. S.P.
Iron Body Gate

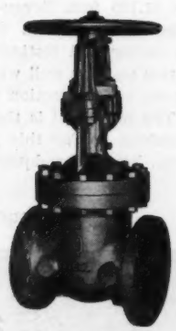


Fig. 1938-D2
300 lb. S.P.
Steel Gate

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Many Unusual Features in Rig Design Reported on Louisiana Discovery

By NEIL WILLIAMS

Facilities provided by Vendome Petroleum Corp. for drilling its No. 1 Kenilworth plantation, discovery well of this company's new field near Poydras, about 25 miles down the east side of the Mississippi River from New Orleans. in St. Bernard Parish, embodied many advancements and unusual features in rig design and operation. Included were some of the most modern and adequate types of equipment available. Special safeguards and conveniences were embraced to insure the successful and efficient drilling of the well.

The rig, new throughout, and one of the most complete ever set up on the Gulf Coast, was assembled with a view of expediting the carrying out of a comprehensive development program covering the company's extensive properties in coastal Louisiana. The Kenilworth well has been the first drilled by the company in this program, and with its completion the rig is being moved to a second location for continuation of the development project.

As an exploratory test, the well was drilled to a total depth of 11,469 feet. A succession of oil and gas sands were found below 10,500 feet to bottom. Chief of these were logged at 10,532-64 feet; 10,597-10,661 feet, 10,895-10,960 feet with several below 11,190 feet. Seven-inch casing was run and cemented on bottom with a view of perforating the casing and testing the sands in order from bottom up. The well was completed with perforating an 18-foot section at 10,608-26 feet.

The new field is the second opened in coastal Louisiana so far this year. Vendome Petroleum Corp., having headquarters in New Orleans, is a comparatively recently organized company, headed by C. L. Thompson as president; R. J. McRae as vice president and treasurer; J. H. Manning, assistant treasurer, and Charles B. Murphy, secretary. D. U. Price is drilling superintendent in direct charge of drilling operations of the company. H. K. V. Tompkins is consultant engineer.

Specific location of the first well is 1,100 feet north of the center of Bayou Terre aux Boeufs and 327 feet west of the east line of the Kenilworth plantation, Section 59-13s-14e. The block on which it is located comprises approximately 19,000 acres in St. Bernard Parish, development of which is supported by torsion balance and magnetometer work by Victor E. Karnes, consultant geophysicist, of New Orleans; reflection shooting by McCollum Exploration Co. of Houston, and soil analysis surveys by Geological Scientific Service Co., Fort Worth.

In addition to this block, the company's properties in coastal Louisiana consist of a block of approximately 7,000 acres in Jefferson and Plaquemines parishes, one of 3,000 acres in St. Charles Parish, and another of about 3,000 acres in West Feliciana Parish. Similar geophysical and soil analysis work was done on all of them.

From a depth of 8,401 feet to bottom, six Schlumberger surveys were run. Depths of the hole and dates when these surveys were made were: 8,401 feet, January 4; 9,879 feet, January 20; 10,532 feet, February 5; 10,844 feet, February 13; 11,153 feet, March 7, and 11,469 feet, March 14. Every effort was made and precautions taken during drilling to provide as thorough a test of all formations as possible.

One of the achievements of the rig in connection with the drilling of this well was the setting of the world's second longest string of 9⅝-inch casing, which was run and cemented in total elapsed time of only 15 hours, 36 minutes, including one hour lost when the rig had to be shut down because of a terrific wind and rain storm. The string totaled 10,807.94 feet, and weight of the casing was 483,673 pounds (241.8 tons). From bottom up the string consisted of the following:

One Baker high cement upwhirler float shoe.

Two joints of 47.60-pound, NG C R-2 flush joint casing.

One Baker Baklu cement float collar.

Vendome Petroleum Corp. No. 1 Kenilworth, near Poydras, St. Bernard Parish, Louisiana

Ninety-six joints of 47.60-pound NG C R-2 flush joint casing.

One combination joint, Speedtite 43.50-pound box to 47.60-pound flush joint Hydril thd. pin.

One hundred and eighty-three joints of 43.50-pound NG C R-3 Speedtite casing.

Bottom of the hole at the time the casing was run was 10,880 feet, reached February 21. Size of the hole was 12¼ inches. At bottom the hole was less than a degree (45") off vertical, which was a factor in the speed and ease with which the casing was run.

Prior to running the casing, 13⅜-inch rams in the blowout preventer were changed to 9⅝-inch rams, and the drilling line was replaced with new Leschen 1¼-inch Hercules preformed, hemp center, 6 by 19 field construction drilling line, which was strung with 10 lines. Drilling mud was reconditioned, using Perfecto Clay, Aguagel, Baroid and Stabilite No. 4 and No. 6. Characteristics of the reconditioning mud were:

Weight, lbs.	11
Viscosity (1,500 cc. in funnel, 1,000 cc. out), sec.	40
Ph.	8.6
Oil, salt, gas or other contamination	none
Temperature—discharge, °F.	122
Temperature—bottom-hole, °F.	224

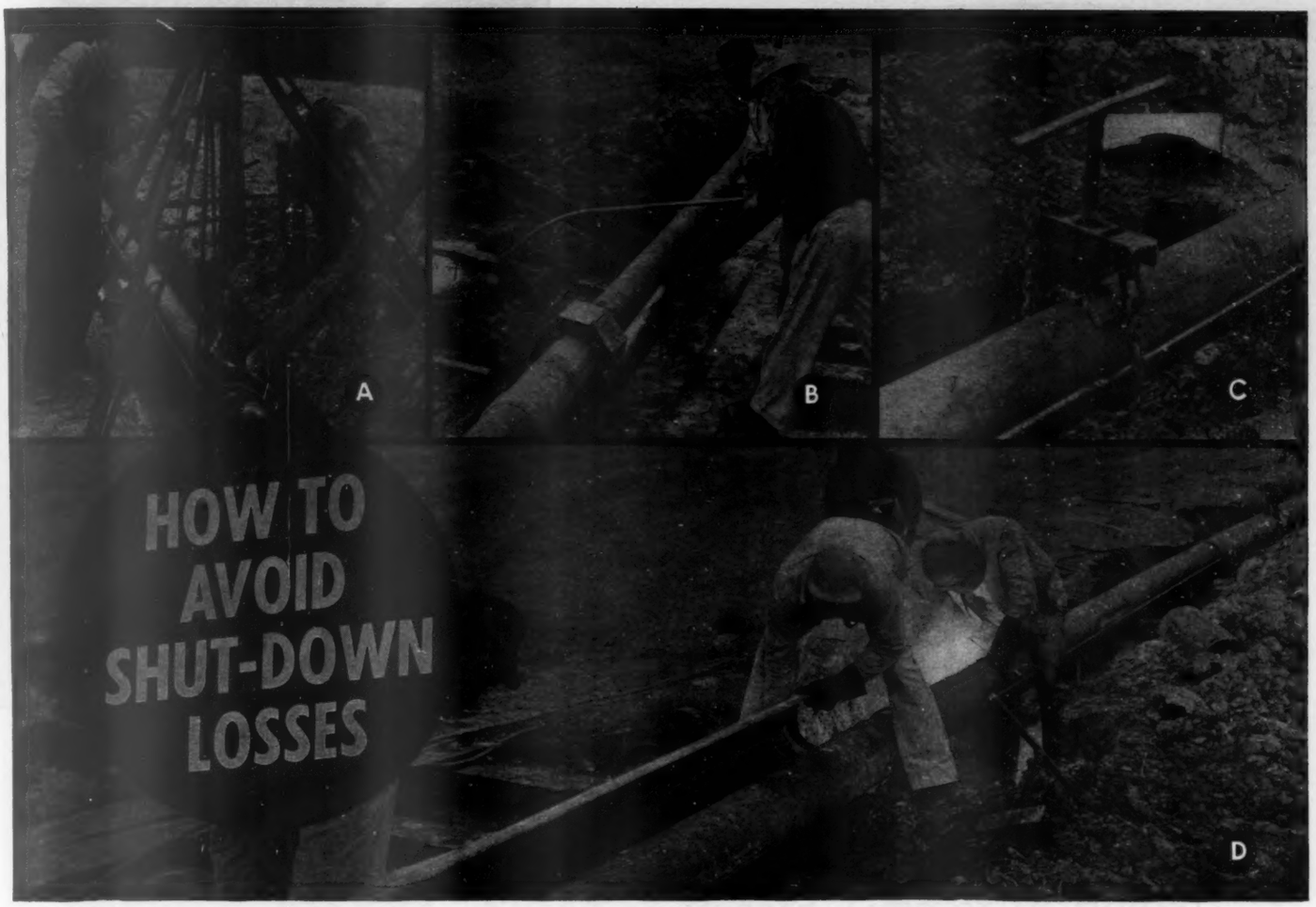
Time summary for running and cementing the string of casing, exclusive of 2 hours and 31 minutes required for nippling up preparatory for running pipe, follows:

Running 98 joints 47.60-lb. R-2 flush joint casing with float shoe and float collar	*5 hrs. 9 min.
Changing stabbing board and rigging up to run 43.50-lb. Speedtite casing and change over joint	18 min.
Running 183 joints R-3 Speedtite casing	8 hrs. 7 min.
Total elapsed time for running string*	13 hrs. 34 min.
Breaking circulation with 10,807.94 ft. of casing in hole (press. 950 lbs.)	25 min.
Nippling up to cement trucks and pumping in about 20 bbls. clear water	15 min.
Mixing and pumping down 1,584 sacks of Starcor cement, pumping cement plug	35 min.
Building up pressure to 2,500 lbs.	53 min.
Total elapsed time for running casing, pumping cement and setting plug*	15 hrs. 36 min.

*Includes one hour lost due to rig shut down during terrific wind and rain storm.

Circulation was broken at 8,500 feet, while run-

Mud pump installation



Recondition Pipe Lines Under Pressure with "SHIELD-ARC" Welding

Following are facts concerning the recent reconditioning of a crude oil line by a large oil company:

LINE: 10-inch. About 20 years old. Located near Lufkin, Texas. Many corroded spots leaked. Reconditioned bad sections.

STEPS: 1. Digging out line. 2. Lifting line (see A). Supporting on timber. 3. Cleaning corroded sections (see B). 4. Fitting on new steel plates with a clamp. (see C). 5. Tack welding plate in place. Finish welding (see D). 6. Painting and wrapping. 7. Relaying line.

WELDING: Half-section rolled plates ⅜-inch thick applied halfway or fullway around pipe, depending upon extent of corrosion. Clamped to pipe with special jig (see C). Tack-welded, clamp removed and then finish welded with two passes made with 5/16" and ¼" "Fleetweld 5" Electrode. Girth bell-hole welds made with two passes of 5/16" V "Fleetweld 5" Electrode. Welder: The new Lincoln "*Shield-Arc*."

★ For further information on pipe line reconditioning and other profitable applications of "*Shield-Arc*" welding, consult the nearest Lincoln office or mail the coupon.

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ning the R-3 Speedtite casing, with 500 pounds maximum pump pressure. With full string in hole, circulation was broken with a maximum of 950 pounds pump pressure. The last 51 joints (2,308 feet) of the string floated in without filling with mud. Two Halliburton steam pumps were used in pumping cement down the hole. After setting plug, pressure was built up to 2,500 pounds, stalling the pumps. Average time for the 98 joints of flush joint casing was three minutes, seven seconds per joint. Average time on the Speedtite casing was 2 minutes, 39 seconds per joint.

Record time also was made in running and cementing the 7-inch flow string. Total elapsed time for this only 11 hours and 40 minutes, divided as follows:

Elapsed time for running casing	10 hrs. 45 min.
Elapsed time mixing cement	20 min.
Elapsed time pumping plug	35 min.
Elapsed time of completion	11 hrs. 40 min.

No difficulty was experienced in running the string, and with casing on bottom circulation was broken with 1,300 pounds pressure. The string, including the Baker float collar and Baker High Whirler Float Shoe, totaled 11,468.83 feet. It was cemented with 800 sacks of Unaflow cement. The casing portion of the string, from bottom up, consisted of:

722.58 feet of 7-inch 30-pound internal flush, externally upset, new Grade D Speedtite casing.
10,523.63 feet of 7-inch, 26-pound, internal flush, externally upset new Grade C Speedtite casing.
217.77 feet of 7-inch, 30-pound, internal flush, externally upset new Grade D Speedtite casing.

The test was spudded in November 30, 1938. At 156 feet 18⅝-inch conductor pipe was run, this being followed with 1,982 feet of 13⅜-inch, 54.50-pound surface casing. As precaution against possible trouble both strings were cemented to the top. After cementing the conductor pipe with 200 sacks of cement, the entire floor of the cellar was recemented around the pipe to make watertight. The pipe then was cut off flush with the floor of the cellar. The 13⅜-inch string was centered accurately with the rotary and derrick, and cemented with 600 sacks of cement. Additional cement was poured in around the outside to fill the annular space between this string and the conductor pipe, making these strings an integral unit with the cellar cement floor, as well as the reinforced concrete slab base underlying the entire substructure and engine foundations.

In setting the 13⅜-inch surface casing, two casing clamps, instead of the customary single clamp, were placed below the collar. These were set at right angles to each other for additional bracing and tie down purposes for the heavy drilling control and blowout preventer assembly. As set up, this installation provides the maximum rigidity and secureness.

The drilling control and preventer assembly is made up of the latest types of Cameron equipment, including, from bottom up, a 6,000-pound test. Type C bradenhead body on the 13⅜-inch casing; a drilling spacer spool having 12-inch flanges on each end; a 6,000-pound test, 13⅜-inch master valve, and two 6,000-pound test preventers. Outside the top preventer is a 6-inch double flange, pressure operated flow line valve. Also included in the hookup is a 10,000-pound test, Hughes flow line emergency valve. With the running of the 9⅝-inch casing 13⅜-inch rams in the lower preventer have been replaced with 9⅝-inch rams.

Drilling control and blowout preventer assembly

Although the cellar is only 9 by 9 by 9 feet, the large assembly is readily accommodated under the derrick floor, this being made possible by changes made in substructure design. These changes give a substantial additional clearance under the floor without material increase in height of the structure.

As a means of providing more working space around the preventer, the assembly is set up diagonally with the cellar. Both floor and sides of the cellar are constructed of reinforced concrete, poured as a single unit with slab base underlying the substructure and engine foundation. Grouted in each corner of the cellar, about half way from top and bottom, are 1½-inch eyes for additional preventer tie-downs. Secured to these, the preventer assembly is free of any sway or vibration. All manual controls have extensions outside the cellar at accessible locations for ready operation in case of an emergency. Pressure operated controls are located on a special platform extension off the main derrick floor where they are convenient, yet leave the derrick floor clear.

Design of the steel substructure, the first of its type, is such as to provide greatly increased working clearance in the cellar without adding to the height of the derrick floor. The structure, designed and built by Emsco Derrick & Equipment Co., is 9 feet 3 inches high with a 30-foot base. In it the rotary table sills are supported, not by transverse cross beams as in conventional design, but by longitudinal beams, on which the rotary table skids rest directly their full length. The beams are spaced 3 feet 10 inches apart and rest on columns which are 12 feet apart. This allows sufficient room for the mud ditch to pass between the supporting columns and also gives room for the installation and controlling of the blowout preventer. Also, the beams are only 16 inches high instead of the usual 24 inches, this giving an extra 8 inches of clearance. As 16-inch beams were not conveniently obtainable, they were built up in Emsco Houston shops from plates, electrically welded together, a distinctive feature of construction.

Unusual is the fact that the rotary table support is independent vertically of the remainder of the structure, although tied into it longitudinally. In this construction, the drill pipe set back is carried by two columns, two "A" frames, and two knee braces, which support the set back sills. Thus, the rotary table supports are relieved of carrying any of the setback load, and concentration of loads around the cellar is lessened.

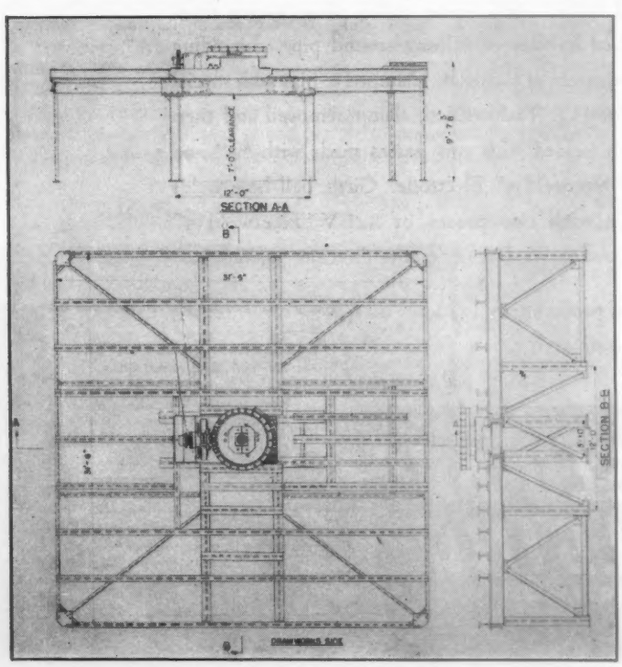
Provision also is made for an auxiliary pipe setback at the right hand side off the end of the rotary. Steel floor sills are used instead of the usual wooden sills, making for additional strength and rigidity with a lessening of fire hazard. Floor sills are slotted so that Emsco's oil tight-rotary chain guard may be used.

Rated load capacity of the substructure, having a safety factor of about 3, is divided as follows: Corner columns, 1,000,000 pounds; rotary table support, 450,000 pounds; main pipe set back, 200,000 pounds, and auxiliary pipe setback 200,000 pounds.

The substructure includes a wood-covered steel ramp for loading material onto the derrick floor, a steel platform extension for the core reel, and another steel platform extension for the blowout preventer pressure operated controls. The ramp has a capacity sufficient to take the drawworks (60,000 pounds) with a drum full of line. The platform extensions were provided to free the derrick floor of as many obstructions as possible.

Engine substructure also is of steel construction, as are the engine house platform and engine house. The only wood in the entire substructure and engine foundation is the derrick floor. In it

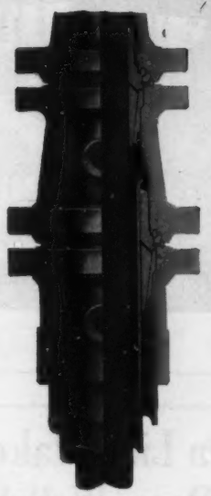
Corner column capacity 1,000,000 pounds, rotary support capacity 450,000 pounds, main pipe setback capacity 200,000 pounds, auxiliary pipe setback capacity 100,000 pounds



THE WORLD'S *SECOND LONGEST* STRING OF 9⅝" O.D. CASING IS *ALSO* SUSPENDED ON A

CAMERON

SLIP-SUSPENSION CASING HEAD!



Cross-section view of Cameron Type "C" Casing Head Housing and Spool in a 3-string hook-up. Note the Type "F" Slip Bowl with neoprene lip seal, which effects an annular space seal the instant pipe is suspended on the slips.

Above—Cameron Type "F" Slip Bowl suspended below the elevators, ready to be lowered to its seat in the Cameron Casing Head Housing.

Left—The complete Cameron Pressure Operated Drilling Control Hook-up installed on Kenilworth No. 1 Cameron Type "C" Casing Head Housing (not visible) is flanged directly below the lower Drilling Control Unit, namely a Cameron Pressure Operated Master Gate Valve.

Vendome Petroleum Corp. Sets 10,808' String in Record Time of 14 Hours!

To Vendome Petroleum Corporation, on their Kenilworth No. 1, St. Bernard Parish, Louisiana, go the honors for successfully running and cementing, in the record time of fourteen hours, the world's second longest string of 9⅝" casing, namely 10,807.9' weighing 483,673 pounds.

And, for the second time in recent weeks, in connection with the world's two longest and heaviest strings of 9⅝" casing, Cameron Type "C" Slip-Suspension Casing Heads demonstrated their advantages of design and construction.

After setting 1,982' of 13⅜" O.D. surface casing, 12¼" hole was drilled to 10,880'. One of the most complete drilling control hook-ups in the oil industry afforded maximum protection at each stage of the drilling and casing running operations. It consisted of: two 12" Series 900 API—6,000 lbs. test—Cameron Type SDA Pressure Operated Blowout Preventers, one 12" Series 900 API—6,000 lbs. test—Cameron Pressure Operated Master Valve, and one 6" Series 900 API—6,000 lbs. test—Cameron Pressure Operated Flow-line Valve.

After cement had set, stretch was taken on the casing and the Cameron slip bowl and slips were lowered through the full opening drilling control hook-up to their seat in the Casing Head Housing to suspend the long, heavy string. Upon removal of the Blowout Preventer equipment, the casing was cut off above the slip bowl and welded to an auxiliary welding hanger with a pressure-tight weld, and then the casing was "belled"—all as illustrated in the drawing above. At this point, a Cameron Type "C" Casing Head Spool, equipped with the unique Flex-Steel Multi-Ring Gasket Assembly, was flanged above the Casing Head Housing to provide a leak-proof seal between strings, and between flanges of the Casing Head Housing and Spool, both pressure-tight seals being controlled externally and entirely by means of the flange studs that tie the two flanges together.

With the Cameron Pressure Operated Drilling Control Hook-up flanged above the Casing Head Spool, drilling was resumed in Kenilworth No. 1, in which several excellent oil sands are reported to have been logged already.

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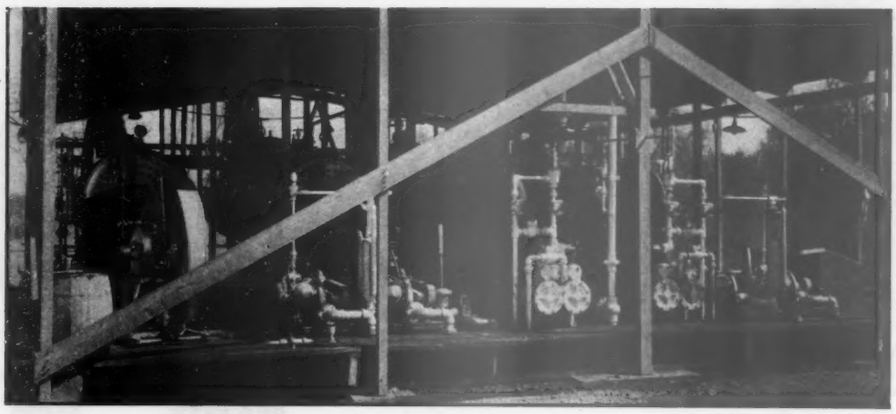


Boiler installation unit

are placed steel plates for the driller's position, and steel grating for places where there is chance of oil or water drips. Stairs, also of steel, to the substructure and engine house platforms are quickly adjustable to different ground level elevations, a feature designed to facilitate moving and setting up the rig.

Derrick is of 136-foot size with a 30-foot base. A special feature is that it has a 15-foot gin pole with a gin pole platform extending the entire length of the gin pole cross beam. The platform is equipped with a guard rail, and the derrick ladder extends not only to the top of the derrick but also to the gin pole platform. These accessories provide maximum safety for those who have occasion to go to the top.

Girt Rope Guards

Another feature of the derrick is the installation of three bottom girt rope guards which fit inside of each of the three long bottom girts, protecting them against bending when loads are pulled into the derrick, and also saving the catlines from undue wear.

The care taken by the company to eliminate every cause of trouble possible, and to provide the maximum efficiency in operation is reflected in the installation of the weight indicator. Instead of being set up on the derrick floor or hung in the derrick, as conventional, where it would be subject to vibration, it is on a 3-inch pipe that extends through a hole in the derrick floor and which is set in the concrete base slab below. There is sufficient clearance in the hole in the derrick floor that none of the vibration of the floor is transmitted to the weight indicator stand.

Another unusual detail is the deadline tiedown. This is a 2½-inch U-shaped pipe grouted, open ends up, into the concrete base slab at a point just inside the corner leg of the substructure. The end of the deadline is run through the U-shaped pipe and secured. The U-bend minimizes wear on the line. Also, with the tiedown in the concrete base, strain is removed from the derrick leg or other parts of the derrick to which the deadline ordinarily is secured.

In assembly of the rig, special attention was paid to balance of equipment in respect to relative sizes and load capacities of the component units. Sizes and weights of the respective units were designed so that no single unit would have a greater size, weight or capacity than could be effectively utilized in coordination with the operation of other units. Thus, in some instances the equipment may not be as large or heavy as that on some other rigs that have been operated on the Gulf Coast, but the effective load capacity of the assembly as a whole has not been sacrificed.

The drawworks is an Emsco four-speed three-shaft unit of a type developed particularly for Gulf Coast use, adaptable for service on large drilling barges where greatest compactness is desired. It is driven by a 14 by 14-inch Gardner Denver 400 pound twin-cylinder drilling engine. Two 15½ by 8 by 20-inch Model H-20, OOOAA Wheland pumps for mud circulation are in the assembly. Steam is generated by four 130-hp. 350-pound working pressure, Farrar & Trefts boilers, fired with oil. The boiler setup is entirely unitized. Automatic controls are provided for boiler feed water and fuel. A Regan Type E 360-ton capacity, six-sheave crown block is used with a Regan 3B 76-inch, five-sheave, 300-ton capacity traveling block. There is an Emsco Type F rotary swivel and a B-J 300-ton Triplex hook. A total of 11,750 feet of 4½-inch (O.D.) by 3¾-inch (I.D.) 18-10-pound Grade D seamless, Hydril internal flush, external upset drillpipe was provided.

Unitization is carried out to a high degree, extending to lines, fittings and other parts of the rig. The layout was carefully planned in detail in advance, with all lines and connections being

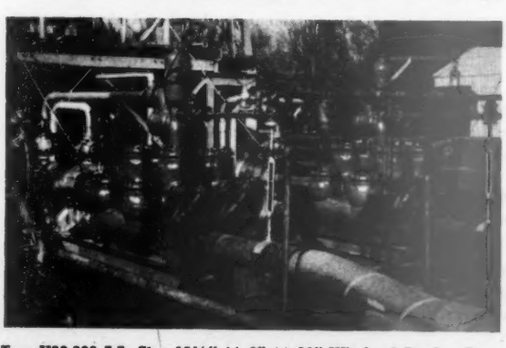
Leschen Line Makes Record for Deep Well Drilling

On Vendome Petroleum Corporation, Kenilworth No. 1 Location, one Reel of 2500'—1¼" 6 x 19 Leschen Preformed Hemp Center Rotary Wire Drilling Line was used in drilling to a depth of 10,800 ft.; 9,465 ton mile service. This cable still has considerable life in it and will be used on next well.

11,480 FT. YOUNGSTOWN SEAMLESS DRILL PIPE

11,480'—4½" 18.30 Grade "D" Youngstown Seamless Steel Drill Pipe with Hydril Joints and Threads. In derrick at Kenilworth No. 1 Location, of Vendome Petroleum Corporation.

Deep Drilling Requires Powerful, Dependable Slush Pumps



Two H20,000-AA, Size 15½" × 8" × 20" Wheland Duplex Steam Pumps as set up on Kenilworth No. 1 Location, of Vendome Petroleum Corporation, in St. Bernard Parish.

It is more imperative than ever, with the deep drilling in the coastal area of Louisiana, that prompt and efficient service be rendered to operators by their suppliers of material. We are meeting this requirement by stores conveniently located, rendering twenty-four hour service, and with an ample number of experienced field salesmen.

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11,035 Feet Down—and Still Going!

Gardner-Denver 14 x 14 Drilling Engine used by Vendome Corporation, New Orleans, La.

Ample Power for Deep Hole Drilling Furnished by GARDNER-DENVER 14x14 DRILLING ENGINE

Extract from Actual Field Report—

The Gardner-Denver 14 x 14 drilling engine has been on the well since it was first started, and the well is now drilled to a depth of 11,035 ft. There has been no shut-down time charged to the engine in all the operating months. There is a possibility that this will be the world's deepest well before the drilling is finished.

When such drilling engine performance is needed on *your* wells, use Gardner-Denver drilling engines. They are designed and built for maximum speed in deep-hole drilling—prevent shutdowns—keep your upkeep costs and wear at a minimum. Full information is yours on request! Bulletin DE-120 will be gladly sent to you.

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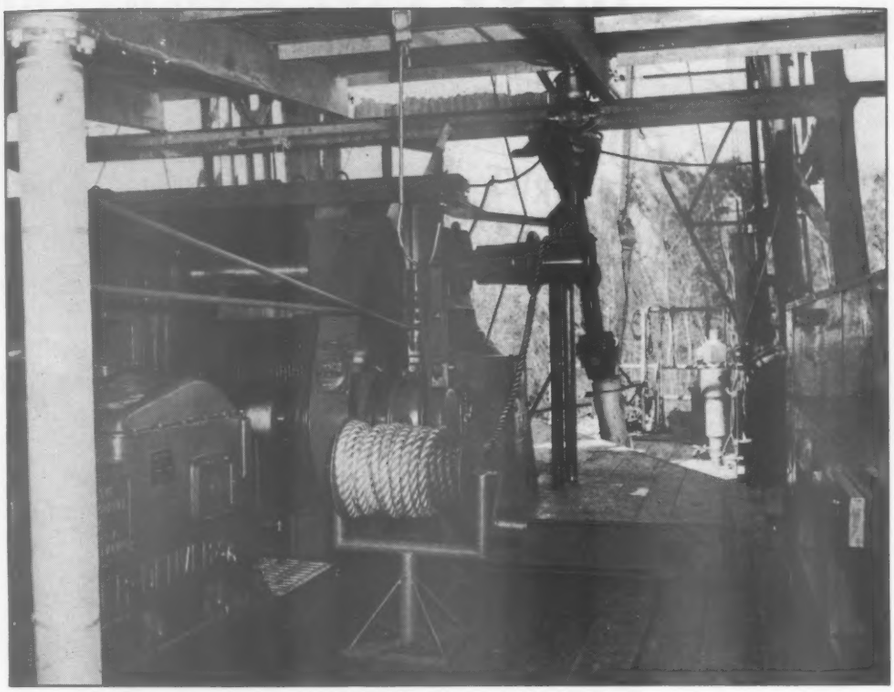
measured and cut to specification, and assembled in sections. The sections are provided with flanged or coupled ends to facilitate assembly with a minimum of fitting on location, and also permit breaking down and moving in sections.

The rig also was designed to minimize hazards and to effect a maximum efficiency in operation. As a safety feature, Crane pipe bends are provided at all pressure points in the lines. Throughout the setup right-angle turns are eliminated to a large extent, the turns or pipe bends being provided as flanged or coupled end sections. Elimination of "T," or other sharp turns, in mud lines tends to minimize power requirements for maintaining circulation volumes and pressures. All steam lines are jacketed. The rig includes a dual lighting system which is vapor and fire proof. All wires are in heavy conduits.

In setting up, and in operation of the rig, the company has given consideration to general appearance, neatness and cleanliness, and to upkeep and protection of equipment. Throughout, everything is kept in the most orderly condition. To begin with, the ground was graded up around the location to provide drainage of water away from the rig and from around the base of the foundations. Also, the solid, reinforced concrete slab, underlying the entire structure, extends out around the outside of the substructure and engine foundations to include a 6-inch drainage ditch, which runs entirely around the outside of the slab. All water or mud that might run off the derrick floor to the base below drains into this ditch, from which it is carried away from the rig. All parts of the rig are kept free of grease or grime, and undergo frequent painting. Covering is provided for boilers, pumps and other such units.

Location of the Kenilworth well is on dry land, which is unusual in that part of coastal Louisiana, much of which is marshy or swampy, but to insure all-weather access a plank roadway was laid to it from the main paved road from Poydras. Reflecting the thoroughness which has been characteristic of the company in the rest of its operations, the roadway was put in substantially, unlike many temporary roads built to wildcat locations. In construction of the roadway extra heavy and large timbers first were laid down lengthwise to the location. These then were covered with heavy planks laid down crosswise. The substantialness of this roadway has proved a saving to the company in facilitating movement of supplies and equipment to the well.



Rear view showing close coupled steam engine and three-shaft hoist

Geophysical Demonstrations at Oil-World Exposition

In addition to a complete display of geophysical instruments there will be demonstrations showing the application of equipment in geophysical exploration at the Oil-World Exposition in Houston. Both the exhibits and the field work will be under the general supervision of the exploration committee of which J. Bryan Eby is chairman.

The experimental grounds of American Askania at Aldine Gardens, north of the city on the Hardy Street Road will be opened for practical demonstrations of some of the instruments. Ed G. Lenzner, general manager of the exposition, advises that trips to the experimental station will be made at 3 p.m. and 5 p.m. on Tuesday and Thursday, April 25 and 27. Out of town visitors will be furnished courtesy car transportation. A section of six booths at the exposition will be devoted to the exhibiting of instruments and a display relative to geophysical prospecting. In Booth 1617 will be shown salt dome sections, samples of caprock, salt, and other dome minerals. Dr. Donald C. Barton, Humble Oil & Refining Co., will exhibit a photograph of Gulf Coast oil fields and the various types of Gulf Coast terrain. There will also be detail sections of several of the salt domes in the immediate vicinity of Houston, such as Pierce Junction, and miniature reproductions to scale of outstanding salt dome structures in the Gulf Coast area. These have been prepared by the geological departments of some of the leading oil companies. The models will demonstrate to the public the relation between the occurrence of oil and the salt dome structure.

In Booth 1619 the American Askania Corp. will exhibit the very latest type of gravitymeter together with photographs, diagrams, and profiles of instruments and field work. The torsion balance and the magnetometer will also be shown. These are typical geophysical instruments now in use by the various oil companies and independents in the search for new oil fields.

Booth 1621 will show a complete representation of seismograph work as carried out in the Gulf Coast. The reflection method will be demonstrated by an electrical display, prepared by the Du Pont Powder Co., illustrating graphically reflection shooting.

Electrical methods of exploration for oil will be given in Booth 1623. A model of Eltran field equipment will be on display, together with diagrams and instrumental parts illustrating this method of exploration which is one of the newest methods of geophysical exploration and employs the use of electrical currents in determining variations and subsurface structures.

An exhibit of the various fossils that are found in different producing horizons in Texas oil fields will be shown in Booth 1625. Booth 1627 will exhibit apparatus to indicate how the porosity of oil sands is determined.

VICTOR E. KARNES'

TORSION BALANCE SURVEYS AND MAGNETOMETER WORK

Discovered the
Vendome Petroleum Corp.'s

KENILWORTH DOME

which is producing oil at 10,600 ft.

also

The Recent Extension To the Charenton Field, St. Mary's Parish, Louisiana, is a Result of Karnes' Surveys.

•

VICTOR E. KARNES, Geophysicist
727-A Whitney Bank Bldg., New Orleans, Louisiana

on VENDOME PETROLEUM CORPORATION'S NEW HEAVY DUTY DRILLING RIG, IT'S

Red-Rex 100%

Vendome Petroleum Corporation is "rigged up" to go places. This progressive company has assembled one of the finest rotary steam rigs ever seen on the Gulf Coast, which is now drilling below 10,000 feet on Kenilworth No. 1, St. Bernard Parish, Louisiana. All quick unions on this model rig are Red-Rex . . . 120 of them, ranging in size from 2" to 10".

Red-Rex Pipe Unions are now available in a complete range of sizes and pressures . . . in both malleable iron and steel . . . all with renewable bronze or steel seal rings.

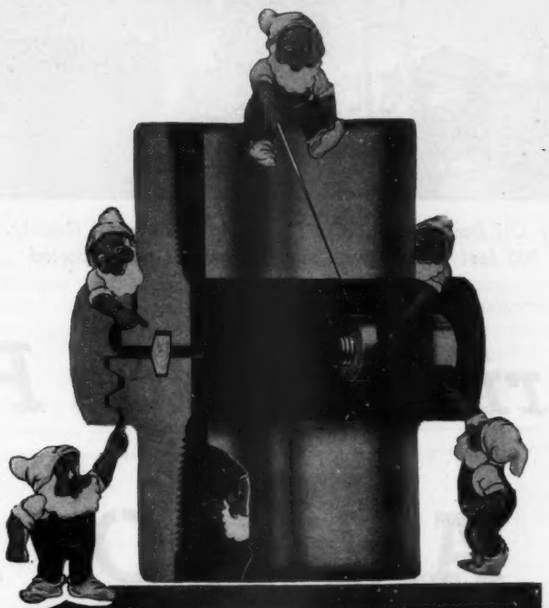
OIL CITY BRASS WORKS

Founders—Manufacturers—Machinists

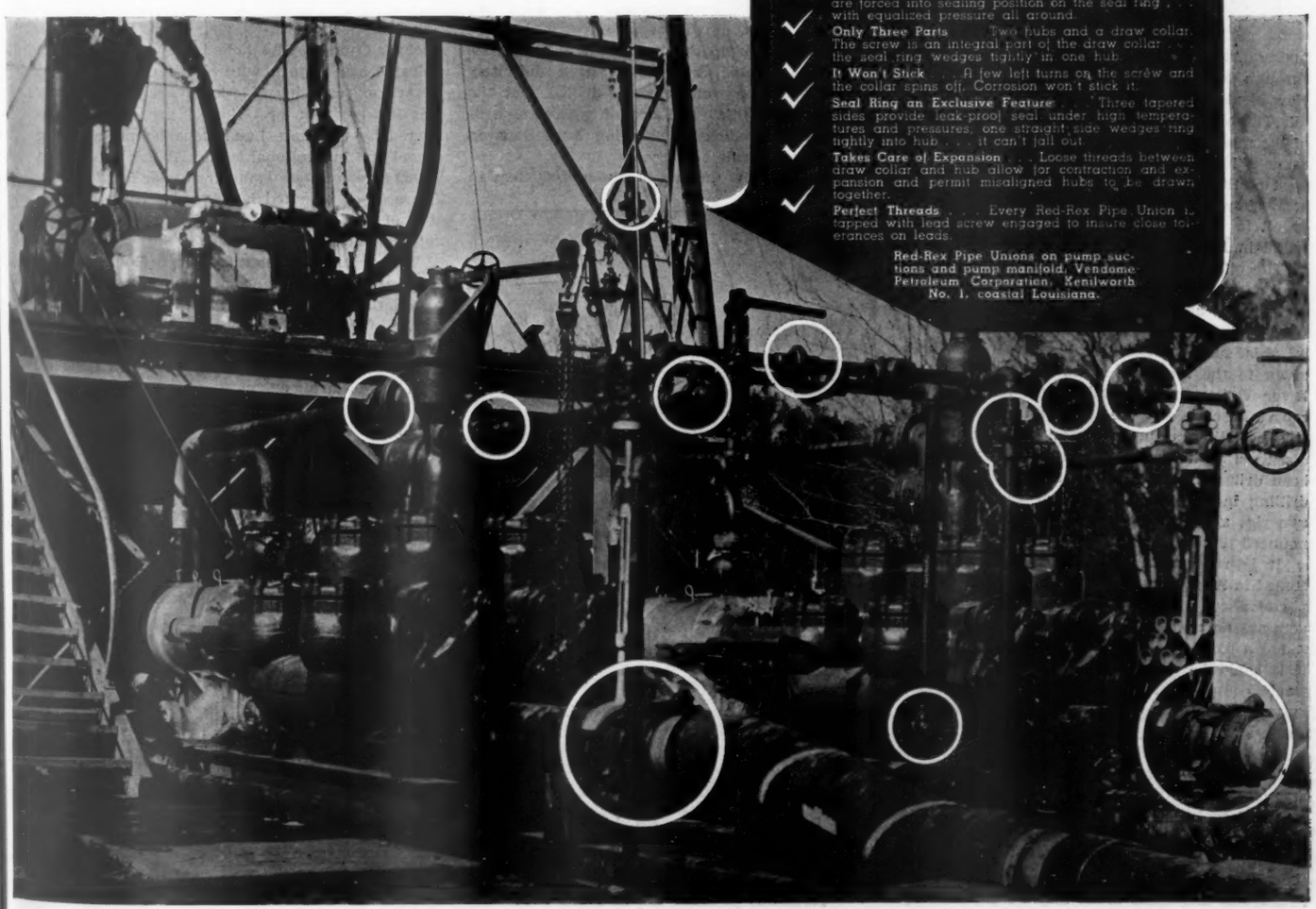
BEAUMONT, TEXAS, U. S. A.

Houston Office: 634 North Edgewood St.
California Representative: 1728 East 7th St., Los Angeles
Export Office: 136 Liberty St., New York City, U. S. A.

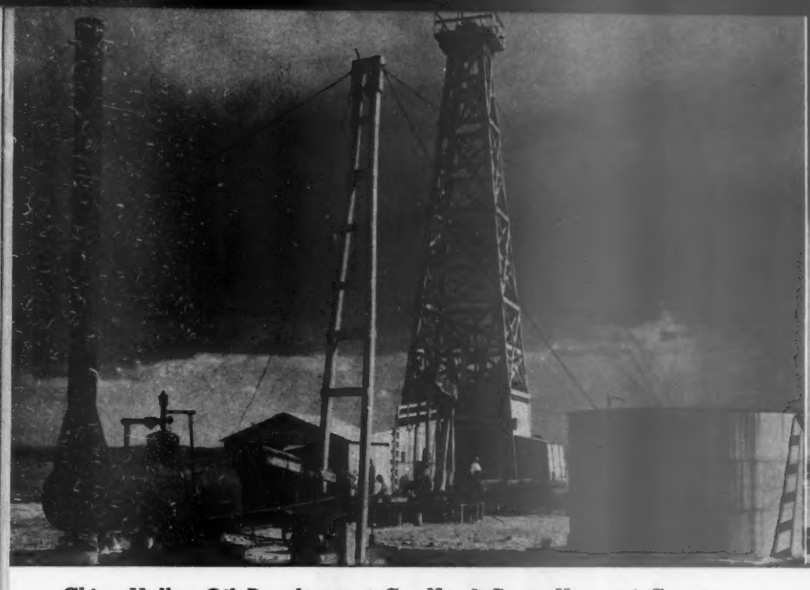
CHECK THE SOUND DESIGN—THE TIME AND LABOR SAVING FEATURES —OF THIS UNIQUE PIPE UNION



- **It's Quick** . . . Tightening or loosening a single screw (125,000-lbs. tensile strength) makes or breaks the joint. As the split collar is drawn together, the hubs are forced into sealing position on the seal ring . . . with equalized pressure all around.
- **Only Three Parts** . . . Two hubs and a draw collar. The screw is an integral part of the draw collar . . . the seal ring wedges tightly in one hub.
- **It Won't Stick** . . . A few left turns on the screw and the collar spins off. Corrosion won't stick it.
- **Seal Ring an Exclusive Feature** . . . Three tapered sides provide leak-proof seal under high temperatures and pressures; one straight side wedges ring tightly into hub . . . it can't fall out.
- **Takes Care of Expansion** . . . Loose threads between draw collar and hub allow for contraction and expansion and permit misaligned hubs to be drawn together.
- **Perfect Threads** . . . Every Red-Rex Pipe Union is tapped with lead screw engaged to insure close tolerances on leads.



Red-Rex Pipe Unions on pump suctions and pump manifold, Vendome Petroleum Corporation, Kenilworth No. 1, coastal Louisiana.



Chino Valley Oil Development Co. No. 1 State, Yavapai County. Drilling at 800 feet in lime with small shows of gas reported

Ari-Copa Drilling & Mining Co. No. 1 Puntenney, Chino Valley, Yavapai County

Arizona Has Passed New Law Aiding Oil Development

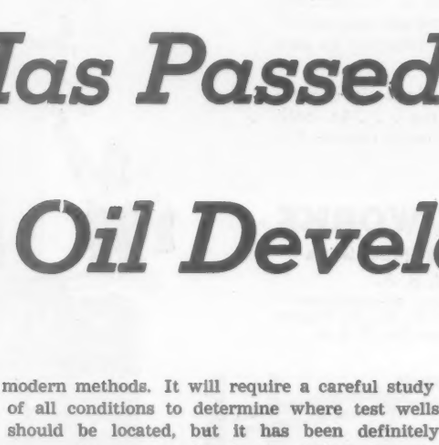
Arizona lies to the west of the main range of the Rocky Mountains which extends through Montana, Wyoming and Colorado into New Mexico, all of which states produce gas and oil. The oil fields are found on the eastern slope of the mountains or in valleys between mountain ranges. Idaho and Utah, as well as Arizona, lie west of the main Rocky Mountain range. While some showings of oil have been had in Utah, gas or oil in commercial quantities has never been found in Idaho or Arizona.

The oil possibilities of Arizona have been recently investigated as a combined state and federal project and a report issued by D. A. Holm, state geologist, which contains much information on this subject. Considerable space has been given to the seepages which occur in the Salt River Valley and in southeastern Arizona. The reports also classify the state into areas of probable petroliferous provinces and these areas are discussed with reports of many wells that have been drilled in them. There are four wells now drilling in Arizona in search of gas or oil and two rigs are standing with several locations announced to be drilled at later date.

It is reported the petroleum products consumed in Arizona represent a daily crude oil supply of about 12,000 bbls. and all of these products are now shipped into the state. While this is not a particularly large demand for crude oil, if it could be filled by locally produced oil it would compare with the production of Montana quite favorably, and Montana has been rated as an oil state for many years.

In the past there has been a tendency by many to look upon Arizona as an area in which gas and oil possibilities did not exist. More recent study of geological conditions, however, indicate there are areas in which there are sedimentary deposits which may contain hydrocarbons. Portions of Arizona contain thick sections of marine formations and these areas may be explored by modern methods. It will require a careful study of all conditions to determine where test wells should be located, but it has been definitely proven by some wells already drilled that the sediments are thick and are of geological ages which have produced oil-bearing formations in other parts of this country.

A well is now drilling at about 6,500 feet in SE NE Section 27-13s-30e, near San Simon, Cochise County. The hole is reported to be in volcanic ash or tuff, with shows of oil and gas.



Funk Benevolent Corp. No. 1 fee, SE NE Section 27-13s-30e, near San Simon, Cochise County, Arizona. This is the deepest well in Arizona, present depth 6,495 feet

Arizona contains 133,966 square miles and of this 15.6 per cent, or 11,400,000 acres, are administered by the state Land Department including school and institutional lands. At this time about 97,000 acres of state lands are under lease for oil. The area of patented lands under lease is probably of like amount, although exact figures are not available.

The Arizona Legislature passed House Bill 80 at the regular session and it was approved March 20, relating to state lands; providing for the issuance of permits and leases for the prospecting, development and operation of state lands for oil and gas, repealing Section 2974, Revised Code of 1928, and declaring an emergency. This law should facilitate the leasing of state lands.

The law defines the terms under which permits for prospecting may be obtained from the land commissioner and limits the area under one permit to 5,120 acres in an area 10 miles square. Drilling requirements are set forth together with operating conditions, rental and royalty and delinquency. One section provides for unitization of blocks upon demand of the commissioner. Other sections are much the same as in other states, and it is hoped, if this law is passed, it will stimulate the leasing of state land in Arizona. It has been pointed out that in areas outside of national forests and the Indian reservations, which are federal lands. practically any block will include some state lands.

While there are no producing wells in Arizona, it is estimated between 60 and 80 wells have been drilled since 1900. The Land Department has records of about 30 wells, but they are mostly based upon drillers' logs and are not very reliable sources of subsurface geology.

In addition to the well in San Simon Valley

(Continued on Page 125)

there are three other tests now being drilled as follows:

L. P. Newcom No. 1 Langley, SE SW Section 30-2n-4e, northeast of Phoenix, Maricopa County, Arizona. Depth about 1,000 feet, 8-inch casing set about 950 feet, preparing to test show of gas.

Samuel F. Reaves No. 1 Fuqua, E half E half Section 34-1n-4w, near Buckeye, Maricopa County, Arizona. Surface pipe set at 192 feet, drilling below 300 feet, having trouble with water sands. Located on structure mapped by geophysics.

Chino Valley Oil Development Co. No. 1 State, Section 20-18n-2w, Chino Valley, Yavapai County, Arizona. Last reported drilling at 800 feet in limestone.

Two locations are reported as follows:

Ari-Copa Drilling & Mining Co. No. 1 Puntenney, Section 27-18n-2w, Chino Valley, Yavapai County, Arizona.

R. W. Schenck No. 1 Boyce, Section 22-19s-17e, near Sonoita, Pima County, Arizona.

Several other locations have been announced, one on a block in Township 7s-14w, Yuma County; one near Glendale, and one near Arlington, all in Maricopa County.

Eight structures in Apache County, in the vicinity of St. Johns, are under lease and two of these are reported ready for drilling this spring.

The report that has been prepared by the state Land Department describes the three geological provinces of the state in detail. These provinces include the plateau, central mountain belt and desert range and basin regions.

The plateau province includes the larger part of the northern half of Arizona, particularly those portions north of the Mogollon Rim and northeast of Aubrey Cliffs. The formations are more or less horizontal, the exceptions being on the several uplifts which border the plateau where the strata are folded and faulted and in a few minor flexures within the plateau where the beds lie at low angle dips. The oil possibilities in this province are considered to be favorable. In the marine sequence of formations occur limestones and organic shales which provide a source of petroliferous material. Sandstones are interbedded with these organic formations and provide reservoir conditions for accumulation of petroleum. The strata are deformed in mild flexures to form a number of anticlinal structures in which petroleum may be trapped.

The central mountain belt varies in width from 10 to 50 miles. The southwest border grades so gradually into the desert basin and range province the two provinces are difficult to distinguish where they merge.

Within the central mountain belt folding, faulting igneous intrusion and volcanic extrusion have occurred to such a degree that little or no petroliferous matter could be preserved in the rocks.

The southwest trend of the state is known as the desert basin and the plain slopes gradually toward the Gulf of California. Its regularity is broken at intervals by elongated mountain ranges projecting out of the plain. The ranges are composed of crystalline rocks of basement complex. They trend to the northwest and the northeast with many intermontane valleys drained by old rivers. These valleys are filled to considerable depth by deposits of alluvium, either lacustrine or fluvial.

The valley were thought to be floored with rocks similar to those of the ranges until wells were drilled in the intermontane basins which encountered no volcanic rocks, in one instance in the San Simon Valley down to 6,500 feet. Examination of the mountains for outcrops of marine sediments has revealed that a large part of the so-called positive element in Arizona was covered by Paleozoic seas. The southeastern part of the element was also covered in Mesozoic time by Cretaceous seas. Much of the sedimentary sequence once present in the basin ranges has been removed by erosion after uplift. It is now suggested the intermontane valleys are down-thrown blocks with sedimentary formations preserved below the valley fill.

This report suggests the possibility of oil in the desert province, as marine sediments may be found in the intermontane valleys below the valley fill, and such sediments may be folded and faulted into structures which provide the desired structural traps for petroleum. Exploration of the desert valleys should be done by "slim-hole" wells and geophysical surveys looking for favorable structures and perhaps stratigraphic traps.

The report states that in the plateau province the areas favorable for petroleum exploration include a large part of Navajo County, various anticlines on the Monument uplift, the Little Colorado River Valley from Cameron to St. Johns, the Rio Puerco Valley between Holbrook and Sanders, the so-called "Strip" in northwestern Arizona and Chino Valley.

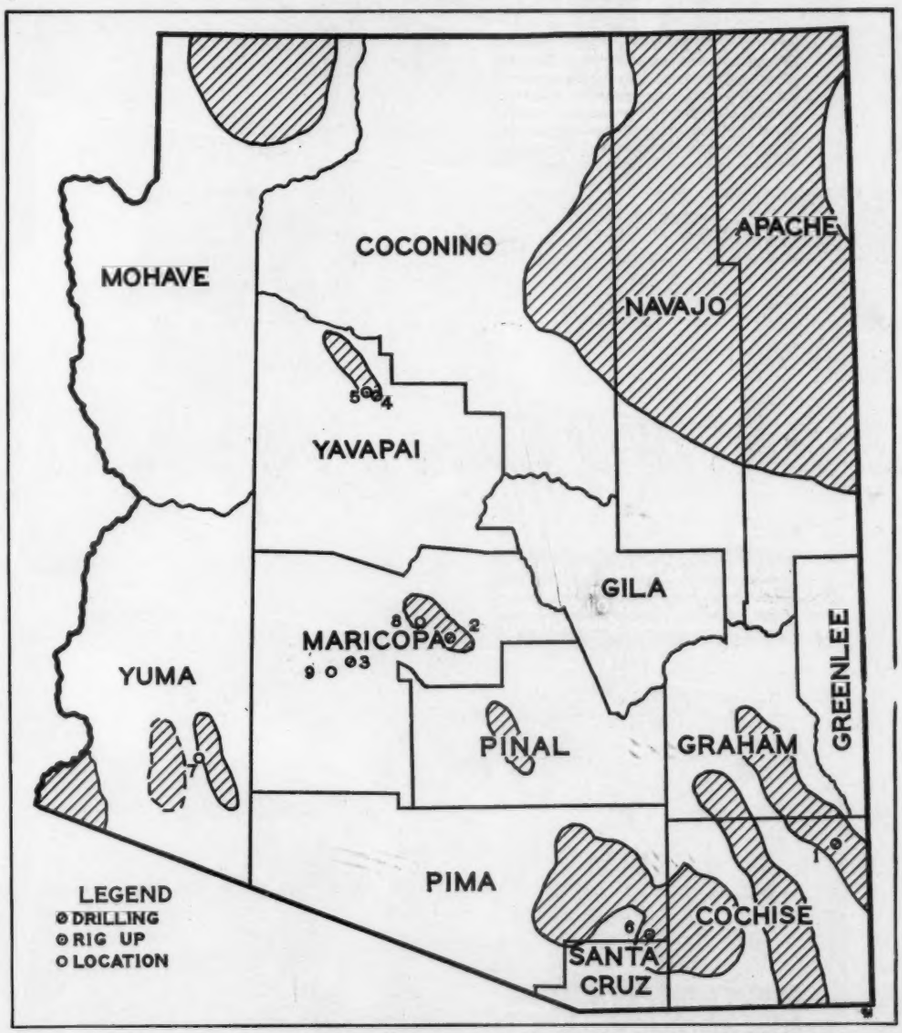
In southeastern Arizona are included the intermontane valleys of Cochise County, such as the San Simon and Sulphur Springs valleys, the Cienaga Basin in southeastern Pima County, the Gila Valley near Safford, and some intermontane basins in the vicinity of Tucson.

The Salt River Valley near Phoenix is considered highly favorable for petroleum exploration on the basis of being an intermontane basin containing abundant probable marine sediments, numerous seepages of high gravity oil, and probable structural traps underlying the valley fill resulting from folding and faulting.

In southwestern Arizona the Yuma Valley, south of Yuma, is considered favorable as probably containing sediments of a relic sea (the Gulf of California), and some of the intermontane valleys in southern Yuma County, such as the Mohawk Valley, may contain suitable marine Mesozoic and Tertiary formations.

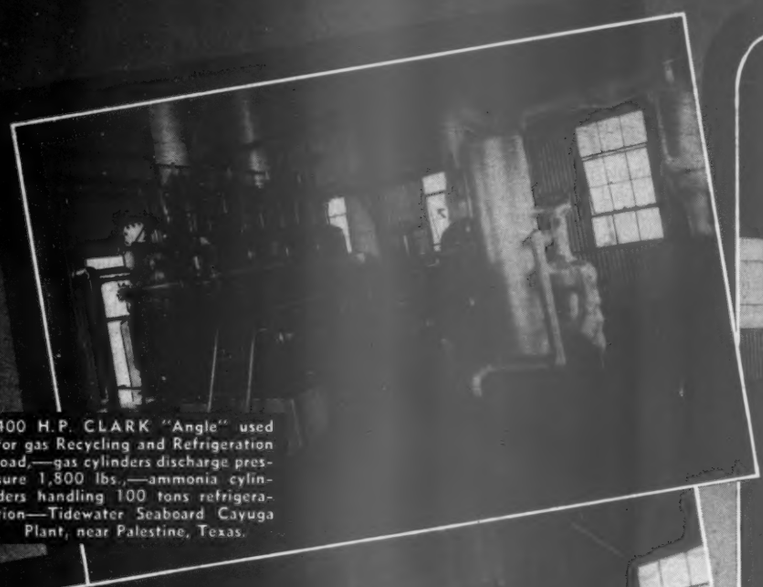
Other intermontane basins in the desert province may be possible petroliferous areas, such as those between Tempe and Tucson.

Much work remains to be done by the petroleum geologist in studying the possibilities in Arizona because the work that has been done has been restricted to mineral deposits, except in some rather broad reconnaissance surveys which outline the stratigraphy briefly.



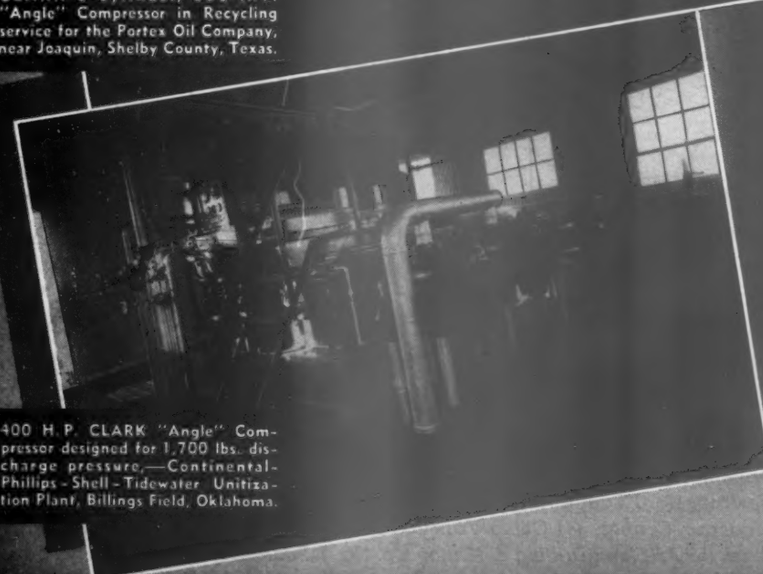
Drilling operations: (1) Funk Development Corp., near San Simon, Cochise County. (2) L. P. Newcom No. 1 Langley, near Phoenix. (3) Samuel F. Reaves No. 1 Fuqua, near Buckeye, Maricopa County. (4) Chino Valley Oil Development Co. No. 1 State, Yavapai County. Rigs: (5) Ari-Copa Drilling & Mining Co. No. 1 Puntenney, Chino Valley, Yavapai County. (6) R. W. Schenck No. 1 Boyce, near Sonoita, Pima County. Locations: (7) Township 7s-14w, Yuma County. (8) Near Glendale, Maricopa County. (9) Near Arlington, Maricopa County

LEADERS IN GAS RECYC



400 H.P. CLARK "Angle" used for gas Recycling and Refrigeration load,—gas cylinders discharge pressure 1,800 lbs.,—ammonia cylinders handling 100 tons refrigeration—Tidewater Seaboard Cayuga Plant, near Palestine, Texas.

CLARK 6-cylinder, 600 H.P. "Angle" Compressor in Recycling service for the Partex Oil Company, near Joaquin, Shelby County, Texas.



400 H.P. CLARK "Angle" Compressor designed for 1,700 lbs. discharge pressure,—Continental-Phillips-Shell-Tidewater Unitization Plant, Billings Field, Oklahoma.

because they bring

For gas recycling and repressuring service in the Midcontinent and Gulf Coast distillate fields, CLARK "Angle" Compressors have been almost the universal choice of operators, to date. Note the "Angle" installations for recycling service shown on these pages, which are a few of the CLARK "Angle" installations that have been made for this purpose.

There must be reasons for this leadership. We believe the basic explanation to be the savings which CLARK "Angles" have introduced. These savings are: (1) Shipment assembled; (2)

CLA

lity

Twenty-two years ago we started to build diesel engines, pioneering new, untrodden paths in the manufacture of high-speed diesels. Unfailing dependability was our first concern. We believed, and still do, that this includes:

Readiness to Serve *. . . an engine that will start cold, every time on your first call.*

A flexibility *that closely parallels the desirable characteristics of the steam engine.*

Smooth running *that assures long life and low maintenance of engine and rig.*

Simplicity *that will make any necessary service, easy and time-saving.*

Economy *in fuel and maintenance that will make the engine a sound investment even on a self-retiring basis.*

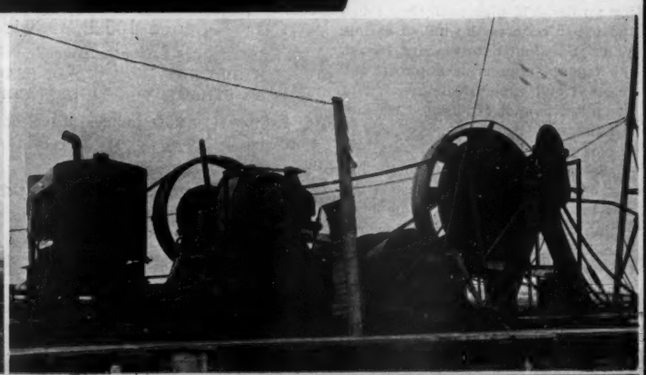
These we are building into the Cummins *Dependable* Diesels.

The Cummins Diesels now owned and operated by prominent oil companies and drilling contractors are the endorsement of this policy . . . convincing evidence of its soundness.

By an active program of oil-field contact and constant engine refinement we propose to assure the continuous DEPENDABILITY of the Cummins Diesel.

By not stinting at any point in its manufacture, we propose to keep the Cummins Dependable Diesel in its present front rank position, believing that there will always be a market for such a diesel among those who look beyond the price tag. • Cummins Engine Company, 1416 Wilson Street, Columbus, Indiana.

Cummins Dependable Diesel Model LP-601-225 hp. at 800 rpm. — cold starting, no preheating devices needed, no electric ignition.



Cummins Dependable Diesel Model HP-601 — 110 hp. at 1500 rpm. Its economy gives a "new low" to cable tool drilling — simple and easy to service.

SEE MID-CONTINENT SUPPLY CO.

LOOK FOR THE BLUE NEON DERRICK

DIRECTORY OF EXHIBITS AT OIL-WORLD EXPOSITION

Houston, April 24-29, 1939

A-1 Bit Company
Houston, Tex.

(Universal Core Barrel Co., Houston, Tex.)

Booths 210, 212, Coliseum

In attendance

S. ROBISHAW — C. L. CLAUSEL
E. J. ROBISHAW — C. B. McDONALD
GEORGE J. BARRETT

Exhibits: Barrett-Robishaw milling tool. Barrett-Robishaw whipstock. Universal wire-line core barrel. Universal wire-line sheave. Universal rock core heads. Universal circulating swivel. A-1 heat-treated blade bits. A-1 heat-treated blade core bits.

New products: Barrett-Robishaw expanding mill—For the first time the oil industry is offered a cutting or milling tool which cuts out not only a side window in the casing but the entire casing string for any desired length, thus eliminating problems of tools hanging in the window, either going in or coming out of the hole or of a window collapsing. It expands from five to eight special hard metal cutting knives that are in the same horizontal plane against the side of the casing at the desired level. This is accomplished by hydraulic pressure from the pump, which is exerted against a piston that has a long tapered plunger attached. By rotary method an entire section of casing can be milled out for any desired length. This cutting or milling tool cuts out not only a side window in the casing but the entire casing string for any length desired, thus eliminating the problem of window collapses or hanging of tools in the window. When the first set of knives become dull, they are closed by pulling up the drill pipe until they touch the upper edge of the milled casing. When the dulled knives are closed, the tapered plunger is automatically released and expands another set of sharp knives that are located beneath the first set. Any number of sets of knives can be used.

Barrett-Robishaw whipstock—The dog on this whipstock is pushed out and in contact with the casing by a spring as the whipstock is lowered into the hole. As the dog reaches the milled section of pipe it is expanded into the open hole and hangs on top of the pipe. This actuates the wedge against the casting, and locks the whipstock in such a position that its top is thrown off center and against the formation in the open hole. It is impossible for bits, survey instruments and other tools to hang in the window with this whipstock and it assures a perfect clean window.

The cut shows Barrett-Robishaw expanding milling tool with knives in cutting position.

Abercrombie Pump Co.
Houston, Tex.

Booths 705, 604, Coliseum

In attendance

J. A. TENNANT, JR. — M. T. WORKS
R. B. (BURCH) LOGGINS

The exhibit will consist of complete 16¼ by 7¼ by 20-inch fluid-piston slush pump, partly disassembled to show various construction features such as the flexible seal sleeve, valve seats that lift out by hand, and integral suction strainer.

Shear Relief valve

An exhibit of Abercrombie pressure gauges in various pressure ranges. Also, a working exhibit demonstrating the uniformly steady reading these gauges give in spite of pressure pulsations and mechanical vibration.

A working exhibit of Shear Relief valves in sizes 1¼-inch to 3-inch and pressure ranges 250 pounds to 2,750 pounds. Also, shown for the first time will be the Type "E" Shear Relief valve for high-pressure gas service such as repressuring plants, etc.—valve construction eliminates lateral reaction.

An exhibit of "Conoco" ball check valves.

Ace Distributing Company, Inc.
Houston, Tex.

And

Feigelson Trailer Company
Beaumont, Tex.

(Representing F. A. B. Manufacturing Company, Oakland, Calif.)

Space 1009B, Outside

In attendance

H. D. GRAF — SAM CAMP
AL STRATTON — JULIUS FEIGELSON

Exhibits: FABCO tamden drive unit mounted on Ford chassis.

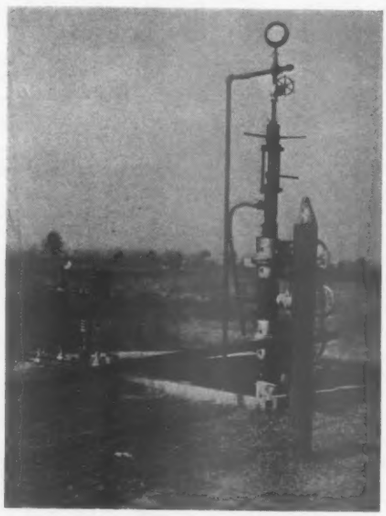
Acme Gas Lift Company
Houston, Tex.

Booths 244, 246, 248, 345, 347, 349, Coliseum

In attendance

WALTER CHURCH, president
F. D. REED, sales engineer
ALLISON PETERS, salesman

Exhibiting the company's gas lift, designed for producing oil where the pressure has been dropped to a point where the desired amount of fluid cannot be produced without artificial lifting. Among the outstanding features are: (1) Positive flow level selection from christmas tree; (2) no continually moving parts in well; (3) low gas-oil ratio; (4) no back pressure on producing formation; (5) low input operating pressures; (6) intermitting flow control for low bottom-hole pressures or low allowables; (7) not necessary to dismantle christmas tree or pull tubing.



Advanced Petroleum Equipment Co.
Houston, Tex.

Space 1024, outside, Bagby and Walker

In attendance

J. L. JOHNSTON — FRANK DANA
E. L. JOHNSTON

Description of exhibits: A new type of polished rod hanger, which allows a rocking action to relieve polished rod of some of its strain. A rotating ball-bearing, with rotating mechanical action to eliminate flattening of sucker rods and greatly assists sucker rod joints in keeping a secure hold. These have been in actual use for a year or more.

A new type of lubricator and chemical pump with from 1 to 12 sight feeds.

Ahlberg Bearing Company
Chicago, Ill.

Booth 1234, Annex

In attendance

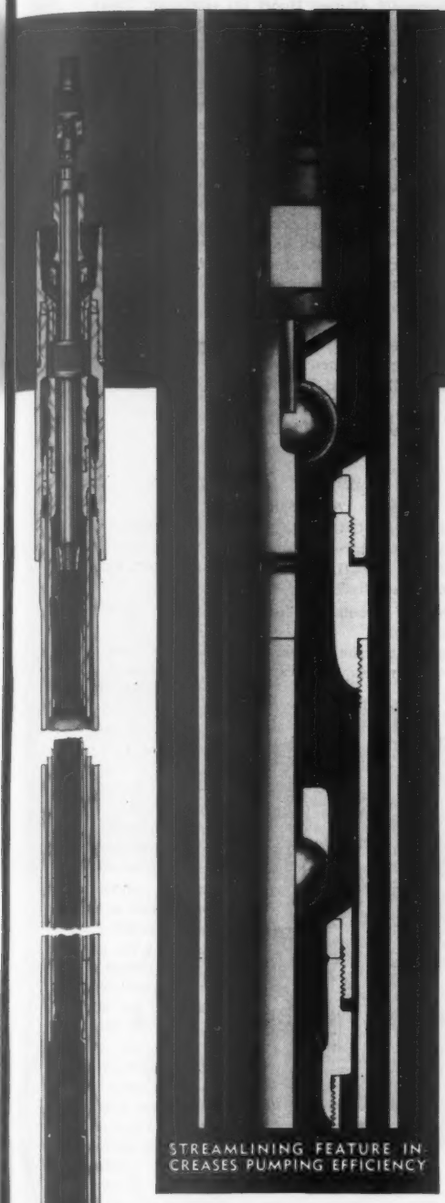
P. H. STAERK — F. S. BARKDOLL
J. I. CLEVELAND

Display will consist of three distinct lines of which the company's ball-bearing pillow blocks will be featured. These are entirely new in design, distinctive in appearance and contain patented features found only in CJB units. Notable among these features is the new method of locking the bearings to the shaft. Three series are available for light, medium and heavy loads.

The second item in importance to the user of bearings for replacement is the company's line of ground bearings, ball bearings which have been reconditioned to the highest standards of new bearing manufacture. The raceways (ball tracks) of worn bearings are precision ground and lapped to provide new surfaces. New oversize balls and a new retainer are fitted, mak-

Don't Be Penny-wise ...and Pump foolish!

Be Specific – Buy PACIFIC



STREAMLINING FEATURE IN-CREASES PUMPING EFFICIENCY

PERTINENT PUMP PHILOSOPHY

These are times when one may be tempted to sacrifice a permanent value for an elusive temporary saving. Cheap pumping costs is the objective, but the goal does not lay in cheap pumps.

Present economic conditions won't last forever: neither will cheap pumps. Real economy is found in constant, uninterrupted, profitable operation — not in cheap equipment, constant interruptions, and continuous repairs. The cost of a good Pacific Pump occurs only once, but the "cost per barrel" goes on indefinitely.

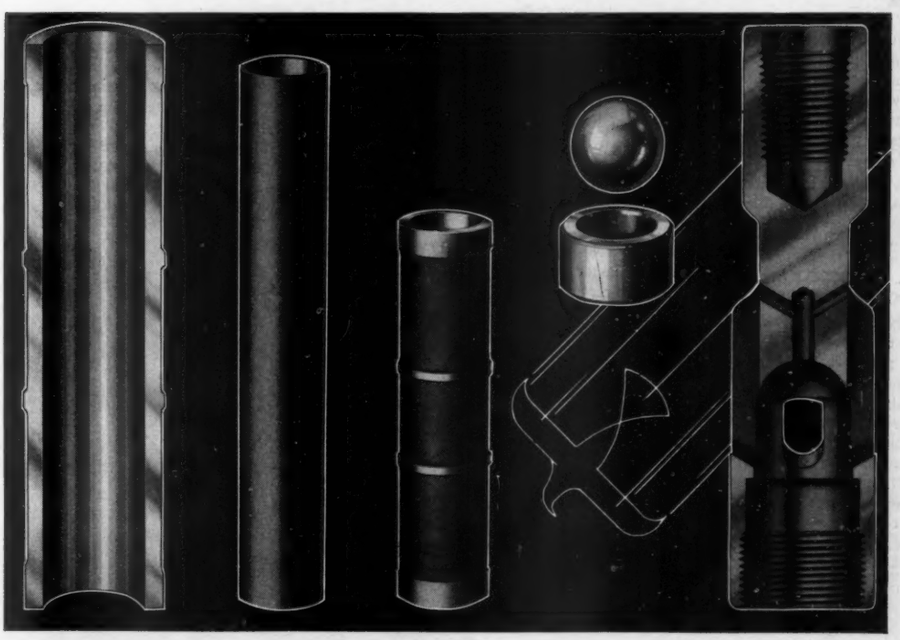
Like other quality products, GOOD pumps cost just so much to make; they can't be "just as good" and sell for less, unless either buyer or seller makes a sacrifice. There's little or no salvage in cheap pumps; they're short lived, "and full of troubles."

While only six years old, Pacific Pump Works has made unprecedented headway in the manufacture and sale of pumps. The reason: CHROME and MOLOY METAL, plus Engineering Design, Modern Plant Facilities, and Skilled Workmanship. Stated another way the reason is, QUALITY PRODUCTS.

WE MAKE ANY TYPE OR STYLE OF PUMP

and in Pacific, you get MOLOY METAL LINERS and PACIFIC CHROME PLUNGERS

CLOSER TOLERANCE WITH LESS FRICTION



Pacific Moloy Liners Reduce the Power Required and Materially Lengthen Life of Deep Well Pumps

Streamlined Cages and Fittings Produce More Fluid with Less H.P.—Less Emulsion—Prevents Ball Spin

Pacific GC-2800 Insert Liner Pump, Top-Support Type For Deep Wells.

Manufactured By **PACIFIC PUMP WORKS** Huntington Park, California

MID-CONTINENT DISTRIBUTOR

MID-CONTINENT PUMP SUPPLY COMPANY

Tulsa, Oklahoma

SEE MID-CONTINENT SUPPLY CO.

LOOK FOR THE BLUE NEON DERRICK

ing the completed bearing the equal in service to that bearing when new. The company's ground bearings are sold only on an exchange basis.

The third item displayed is its line of CJB master ball bearings. These are precision made new bearings of the highest quality. They are made in standard single row, angular contact, double row and self-aligning types. They are interchangeable type for type with other well-known bearings.

Air Activities, Inc.
Houston, Tex.

Space 1026-A, outside

Air Reduction Sales Company
New York

Booths 1104, 1106, 1108, 1219, 1221, 1223, Annex

In attendance

C. D'W. GIBSON, vice president in charge of sales
G. VAN ALSTYNE, advertising manager
H. W. READE, apparatus sales manager
H. L. ROGERS, manager—A.E.D.
D. F. McCANDLISH — H. T. WADLEY
L. D. SUGG — V. FORGETT

Magnolia-Airco Gas Products Co.

W. A. SHERMAN, president
J. F. PRYOR, vice president
L. A. HAMILTON, assistant sales manager
L. D. SUGG — C. C. CAMPBELL
R. A. HOLMES — F. W. SMITH, JR.
R. BRUNT — W. MALONE
L. P. MARBURGER — G. A. MYERS
J. D. SCHWARTZ — E. L. WILKINS
O. L. WOOD — F. W. SMITH
R. A. MERRITT

Wilson Welder & Metals Co., Inc.

T. B. HASLER, president
I. B. YATES, general sales manager

National Carbide Corp.

E. C. ACKERMAN, vice president

Listed as exhibitors in these spaces in the official directory will be: Air Reduction Sales Co., Magnolia-Airco Gas Products Co., National Carbide Corp., Wilson Welder & Metals Co., Inc. and Crutcher-Rolfs-Cummings.

Will have a display consisting of Airco oxygen, acetylene, welding and cutting apparatus and supplies, National carbide and Wilson arc welders. Practical demonstrations will be conducted throughout the show and will consist of casing welding by the electric arc process, machine gas cutting with the Airco No. 6-A Oxygraph, and flame hardening of oil field equipment.

The Aldrich Pump Co.
Allentown, Pa.

Booth 1339, Annex

In attendance

L. T. BORNEMAN, general sales manager
COL. JAY A. ROSSITER, district representative

Exhibiting the company's 3 by 6-inch vertical triplex oil repressuring pump, fitted with Kosmos porcelain plungers, rated capacity 66 g.p.m. at 120 r.p.m. against 715 pounds discharge pressure.

Also the Aldrich-Groff "Powr-Savr" vertical triplex controllable capacity pump, rated capacity 35 g.p.m. maximum at 156 r.p.m. against 350 pounds discharge pressure. This is an entirely new design pump.

There will also be a display of the company's "Kosmos" porcelain plunger, a specialty found only on the company's pumps, which has become a standard fitting on its oil repressuring pumps in the Appalachian field.

Alex Corporation
Niagara, N. Y.

Space 1101-A, Annex

The Allis-Chalmers Co. (Tractor Division)
Milwaukee, Wis.

Location 1039 (outside)

In attendance

A. J. SIMPSON — R. C. SCOTT
E. ABRAMSON

Will exhibit a wide variety of its products which it is felt will interest oil men in every branch of the industry. Included will be the Speed Maintainer, a new type of tool capable of reducing road maintenance and light construction costs through higher working speeds, lower operating cost and less initial investment. The heavier Speed Patrols used for grading and construction will also be shown.

The Special "WM" tractor-Hough Loader, a mobile, 31-hp. self-loading and dumping unit, is offered for its

"WM" Hough loader

versatility in digging slush pits, constructing fire walls and general usefulness.

Familiar to all oil field men will be the 49-hp. Allis-Chalmers Model "WK" equipped with a Tulsa Winch and Baker Bulldozer. A gasoline companion to the already familiar Diesel fuel Model "S-O"—the 64-hp. Model "WS," will also be exhibited. This new tractor was developed through demands from the field and in developing it, the company says it has been able, through advanced design, to greatly reduce fuel consumption.

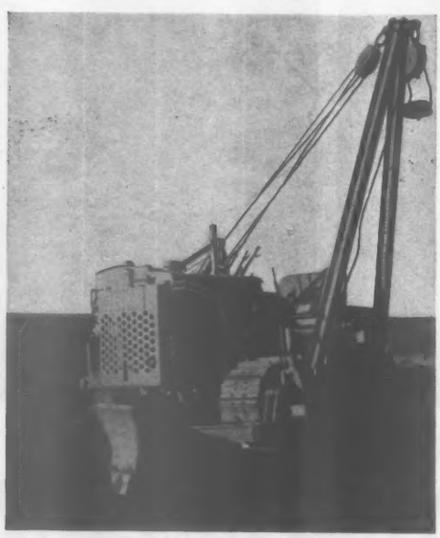
Allsteel Products Manufacturing Co.
Wichita, Kans.

Booth 1033, Walker Avenue

In attendance

H. W. CARDWELL, president; ARTHUR HARVEY, sales manager; H. W. CARDWELL, JR., assistant in sales department; R. B. GILMOUR, salesman; EARL MARSH, salesman; D. W. RICHARDSON, salesman; B. J. LORTS, salesman; PAUL A. LAGO, advertising manager.

Description of exhibit: Model R single drum servicing hoist, powered with Hercules HXE. Model R double drum drawworks, powered with Caterpillar D-13000. Model K single drum servicing hoist with Waukesha GAKU. Double drum Mobilhoist with mast, spudder and rotary drive assembly powered with Buda K-428. Model PG sideboom with plate backfiller, mounted on Caterpillar D6 tractor.



"Blade Backfiller" can be mounted on Caterpillar Model R5 gasoline or D6 Diesel wide gauge tractor with "Cardwell" Allsteel Model PG sideboom. There is no confliction between the mounting and operating mechanism of either item. This development eliminates the necessity of removing the blade for pipe laying or the sideboom when backfilling trench. The result is no lost time on the job and consequently reduced costs. The operator has clear vision ahead and to the sides. The blade is hydraulically operated by a single lever control placed near the operator's seat. The lift of the blade is approximately 1 foot per second, a total of 28 inches above track and 8 inches below. The blade can be locked in any position. The moldboard is thoroughly reinforced by ribs and a large size box beam across the entire bottom of the blade, so placed that it takes the heaviest strains. The push bars are of large size H-beam section, extremely strong but not heavy.

The "Blade Backiller" can be easily mounted on tractors above mentioned now in the field and equipped with "Cardwell" Model PG sideboom.

American Air Filter Co., Inc.
Louisville, Ky.

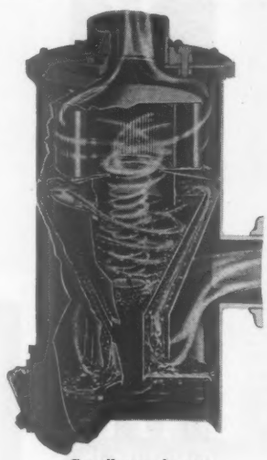
Booth 666, Coliseum

In attendance

WILLIAM K. GREGORY, division manager; C. C. SOWERBY, southwestern division sales manager; HOWARD M. FITCH, assistant sales manager, engine and compressor division.

Exhibiting Cycoil oil bath air cleaners and gas cleaners.

1. Gas enters the cleaner through lower pipe connection and travels downward where it comes in contact with oil. Here the heaviest dust particles are immediately caught in the oil.



Cycoil gas cleaner

2. Oil is picked up by the gas stream and this oil and gas mixture travels upward between the two cones. Here a thorough scrubbing action takes place, tending to wet each dust particle, or place it in actual solution in the oil.

3. At the top of this passage between the two cones the gas and oil mixture impinges against a plate to cause an abrupt change in direction. It then travels downward through vanes which impart a whirling motion.

4. The whirling motion imparted by the vanes sets up a cyclonic action which throws most of the oil to the side walls of the inner cone. As most of the dust particles are in the oil or wetted by the oil by the time this action occurs, they are thrown out with the oil.

5. The precleaned gas containing a fine oil spray then spirals upward and passes through a "sinuous" filter cell, which removes any remaining oil and dust it may contain. Construction of this "sinuous" cell is such that it cannot plug up.

American Askania Corp.
Houston, Tex.

Booth 1410, Annex

American Bosch Corporation
Springfield, Mass.

Booths 105, 107, Coliseum

In attendance

CARL BEHN, vice president
LEE C. CARLTON, sales manager, western division
FRED BEHRENS, sales engineer

Exhibit will include magnetos, fuel injection equipment for Diesel engines, ignition coils, generators, and electric windshield wipers. The new Heavy-Duty magneto will be a feature, its spark output being vividly demonstrated by means of a novel display stand which portrays the progress in magneto ignition during the past quarter century. This new heavy-duty magneto,

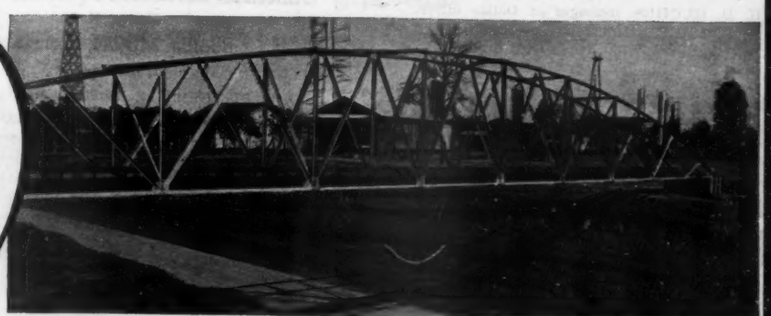
HOW NAYLOR'S LOCKSEAM SPIRALWELD CUTS INSTALLED COST

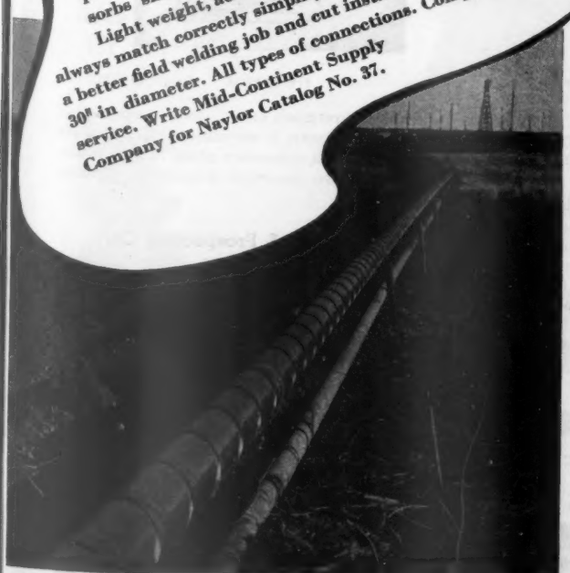
In NAYLOR Surface Casing With Threaded Joints . . .

Naylor's exclusive Lockseam Spiralweld structure helps centralize Naylor Casing in the hole . . . provides a "breathing space" around the casing . . . helps prevent channeling . . . insures a better cementing job. No joint welding required . . . no field welding equipment necessary. Light weight, uniform lengths and accurate threading to A. P. I. Standards simplify handling and setting. All these factors combine to give PLUS performance at cheaper installed cost. Sizes: 13 3/8" O. D., 16" O. D., 18 5/8" O. D., 20" O. D. and 21 1/2" O. D. Interchangeable with A. P. I. Standard casing. Ask Mid-Continent Supply Company for complete details, or write us direct.

In NAYLOR Line Pipe . . .

No other light weight pipe compares with Naylor for vacuum lines or lines eventually to be operated under vacuum. Naylor's Lockseam Spiralweld produces a leak-proof pipe with a continuous expansion joint which absorbs shock loads and stands up under toughest usage. Light weight, accurate diameter and concentric ends that always match correctly simplify handling and assembly, insure a better field welding job and cut installed cost. Sizes from 4" to 30" in diameter. All types of connections. Complete fabrication service. Write Mid-Continent Supply Company for Naylor Catalog No. 37.





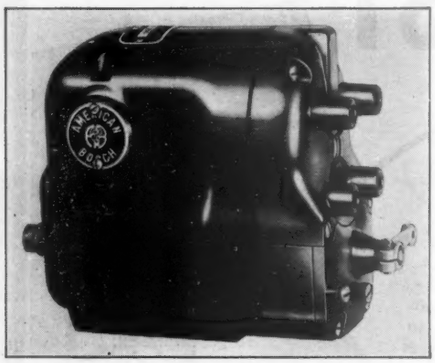
NAYLOR PIPE COMPANY 1232 EAST NINETY-SECOND STREET CHICAGO, ILLINOIS

SEE MID-CONTINENT SUPPLY CO.

LOOK FOR THE BLUE NEON DERRICK

it is stated, is particularly important in the oil fields because it was designed to meet the most severe demands of high-compression, large-bore engines; also fuel injection, spark ignition engines using low-grade fuels, as well as engines using natural gas, butane, and propane.

The exhibit will also include an interesting demonstration showing the functioning of the company's fuel injection equipment used by the majority of man-



ufacturers of Diesel engines and Diesel powered machinery in this country. This will also feature the company's new Final-Stage fuel oil filter, a sealed type of unit which, it is claimed, removes from fuel oil the finest particles of dirt that frequently pass through ordinary filters, and damage the finely lapped surfaces of fuel injection pump plungers, barrels, as well as nozzle valves. Installing this inexpensive new unit as a final filtering element is said to provide veritable life insurance for fuel injection equipment.

American Cast Iron Pipe Co.

Birmingham, Ala.

Space 1066-B, outside

In attendance

H. D. HUGHES, manager of Dallas office.
R. E. MAGEE, Houston representative.

This truck is a traveling exhibit equipped with samples of Mono-Cast centrifugal pipe and the latest design of fittings, joints and accessories. To mention only a few, high pressure tests of pipe and joints, bending tests of pipe, and a machine to illustrate the centrifugal principle of casting Mono-Cast pipe, are interesting features of the exhibit.

American Chain Division of American Chain & Cable Co., Inc.

Bridgeport, Conn.

Booths 725, 727, 729, 731, and 733, Coliseum

In attendance

American Cable Division

R. D. McNUTT — E. L. KLINGER
J. S. MOON — J. L. RAGAN

The material displayed in each booth follows:

Booth No. 725—American Cable Division, Wilkes-Barre, Pa. Various grades of wire rope used in the oil fields.

Booth No. 731—American Chain Division, Bridgeport, Conn. Welded and weldless chain items, featuring a new Endurweld chain, an entirely new chain in the line, made exclusively by the American Chain Division.

Booth Nos. 727-729—Reading-Pratt & Cady Division, Bridgeport, Conn. Iron and steel valves.

Booth No. 733—Wright Manufacturing Division, York, Pa. Electric hoists and various types of hand chain hoists.

American Iron & Machine Works Co.

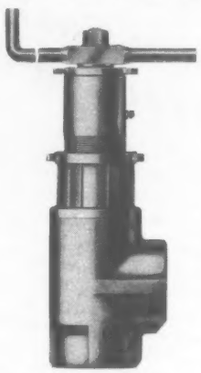
Oklahoma City, Okla.

Spaces 428, 430, Coliseum

In attendance

JOHN F. CAILLOUX, president
EARL W. MILLER, vice president-treasurer
JOHN R. RILEY, sales manager in charge of exhibit
GEORGE S. HINKLE, district sales manager, Gulf Coast
FRED RYALS, assistant district manager, Gulf Coast
P. K. RIDGE, sales representative
L. D. MURRAY, sales representative
O. L. GARRETT, sales representative

Included in the exhibit the company announces will be the American manifold valve, a new but proved successful product.



The valve is a new departure in rising steam, high-pressure angle valves. Among its many uses, it is outstanding as a pump manifold valve. The locking feature on the top of the stem housing permits the valve to be set at any position desired, doing away with creeping of the valve stem. The valve stem is made in two parts separated by a ball bearing, reducing friction considerably, while opening and closing the valve. The valve is tapered and sets in a removable seat. All parts may be removed or replaced without disturbing connections in the valve body.

Additional new products displayed are the company's compounding valve, "Simplomatic" cathead, Type "MT" tubing support, and drill pipe elevator.

American-LaFrance-Foamite Corporation

Elmira, N. Y.

Booths 742-744, Coliseum

In attendance

D. D. FITZGERALD, district manager

Exhibit introduces the Poweron nozzle. Details will be shown of the safe use of the Poweron on electric equipment up to 250,000 volts. This device, it is stated, is also effective on flammable liquid fires, as well as fires in ordinary free-burning materials. This new water spray nozzle has the triple Underwriters' rating —"A-B-C."

The company will also display its complete line of Alfite carbon dioxide and Foamite portable and semiportable devices.

American Optical Co.

Southbridge, Mass.

Booth 531, Coliseum

In attendance

HOWARD BOURNE, Dallas branch; WALTER G. ENGLE, Kansas City branch; and either C. H. GALLAWAY or T. P. WELCH, from main office.

Will exhibit its complete line of safety equipment, such as safety spectacles, safety goggles, safety clothing, welding helmets, face shields, and respirators. The new products to be featured by the company are—its new R1000 respirator, its new and complete line of safety clothing, welding helmets, and hand and face shields.

American Sand-Banum Co., Inc.

9 Rockefeller Plaza, New York

Booth 232, Coliseum

In attendance

L. BRADIE — F. J. WELU
P. P. ELLIOTT

Will exhibit Sand-Banum Standard, a pure colloidal concentration which is said to eliminate all formation of scale and corrosion in boilers. The company says it does not contain any acid or caustic material and is harmless to all equipment and to persons applying it; it comes ready for use in 16-ounce cans, and a few ounces from one to four times per month is all that is required; its action is mechanical rather than chemical; it holds all water impurities in suspension and thus prevents their crystallizing into scale; its simplicity, safety and certainty are of particular value

in the oil industry as it gives the same service regardless of the operating conditions or the nature of the water used.

Sand-Banum Blue Seal Emulsion, it is said, does the same for the cooling systems of internal combustion engines that the Standard does for boilers; not only does its use eliminate and prevent scale, corrosion and rust, but it prevents cracking of cylinderheads, leaks and overheating.

Sand-Banum Special, in tablet form, is used to dissolve and remove old scale and rust from radiator cooling systems of Diesels, automobiles, trucks, buses, tractors, etc.; it also prevents formation of new scale and rust.

American Pipe & Steel Corporation

Alhambra, Calif.

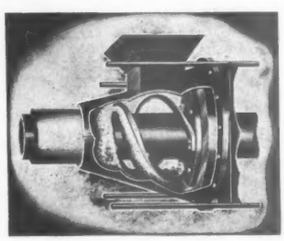
Booth 1133, Annex

In attendance

JOHN McMILLAN, sales manager
KEITH GALVIN, sales representative

Featuring actual demonstrations of American's Seam Tester, a new, patented product, which the company states is positively right every time, under any condition, in any place, in revealing costly unsuspected leaky seams. It is specially designed and constructed for speedy leak detection in all types of storage tanks and pipe lines as well as hulls and ship decks.

Other products displayed by the company are Unitank flanges, and Armor-Clad, a protection for new



Armor-Clad

pipes and the rejuvenation of old pipes in service, according to the company, a scientific, practical application for surface and subsurface pipes to give a lasting protection against corrosion, electrolysis, abrasion and soil stresses.

American Well & Prospecting Co.

Corsicana, Tex.

Space 1016, outside

In attendance

J. E. RITTERSBACHER, president; EDGAR RITTERSBACHER, vice president; L. R. ESTES, secretary; ELIOT JOHNSTON; CARL M. ANDERSON, chief engineer; H. E. REDDEN, plant superintendent; LEE FAGG, field engineer salesman; OSCAR HOHL, Houston district manager; STALEY KESSINGER, field service salesman.

Will exhibit a complete Gumbo Buster mechanical rotary rig which it recently designed for shallow or medium depth drilling. The rig is built for 200 hp. or a maximum depth of 4,000 feet using 4½-inch A.P.I. drill pipe. It is readily adaptable for slim-hole drilling and can be used for drilling to greater depth than 4,000 feet when smaller than 4½-inch drill pipe is used.

The rig will consist of a new 17½-inch oil bath ball bearing high-speed rotary, a newly designed FC-

OIL FIELD ENGINEERS CHOOSE LUDLOW FOR FOUR GOOD REASONS

LUDLOW Flanged-End Valve. All-iron or iron body bronze-mounted.

Four stand-out features of LUDLOW Valves give them leadership in the oil fields:

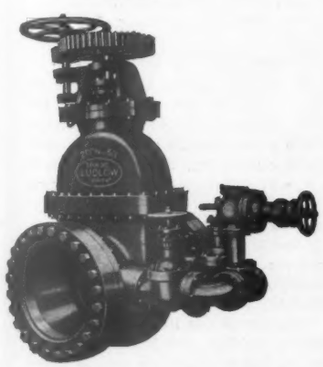
- SMOOTH, POSITIVE OPERATION. Gates positioned *directly* opposite ports *before* wedging, and entirely unwedged *before* being raised.
- POSITIVE CLOSURE—even after years of service in the open position; 30° wedges; gates *self-adjusting* to seats.
- SELF-CLEANING. Seat rings cleaned *throughout entire stroke. No internal guides* to cause foul-up.
- READY REPLACEMENT OF PARTS. Simple construction to ample tolerances, permitting ready replacement of parts.

Only the parallel seat, double wedge type slide gate valve provides *all* these essential benefits. This principle, developed and perfected by Ludlow, has been universally accepted and preferred for oil, gas, and water lines since 1866.

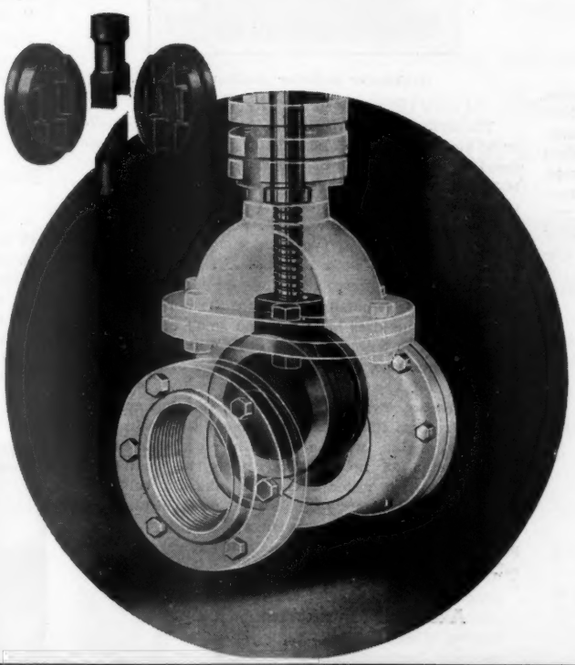
LUDLOW Screwed End Valve

Old-timers in the oil fields call LUDLOW the "most *flexible* valve."

Ludlow valves are available in all standard sizes and types, and for all special purposes.

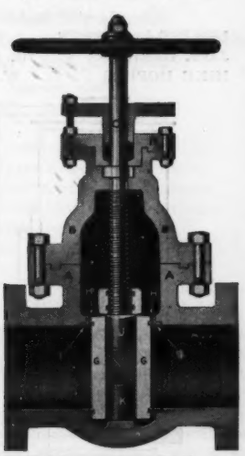


MID-CONTINENT SUPPLY CO.
FORT WORTH, TEXAS



The LUDLOW VALVE MFG·CO· SINCE 1866 TROY·N·Y·

Delay of wedging action until gates are opposite ports guarantees minimum wear of the rings, and long, positive service.



SEE MID-CONTINENT SUPPLY CO.

LOOK FOR THE BLUE NEON DERRICK

200 friction clutch drawworks with four speeds to the drum and rotary. This new drawworks is designed so any of the four speeds can be instantly engaged with one lever without varying the speed of the engines. An improved Texrope drive is employed and rotating elements with friction clutches so designed that the two engines and rotating elements can be used without a belt idler and can be quickly drawn together within an 8-foot width which enables it to be moved as a single unit.

A new 7¼-inch by 14-inch gear-driven slush pump with 150-hp. gear end and cast steel fluid ends, small crown and traveling blocks, swivels of correct size and capacity to complete a well balanced small mechanical rig.

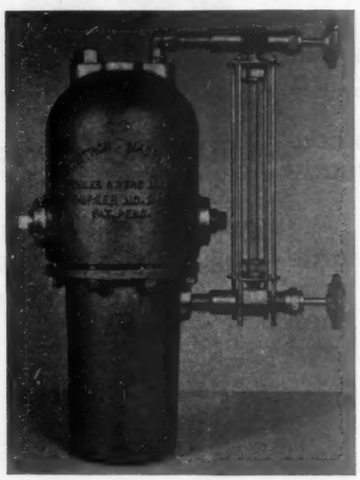
Armstrong Machine Works
Three Rivers, Mich.

Booth 1564, Annex

In attendance

O. E. ULRICH — T. H. REA
GEORGE B. ALLAN

Exhibiting a black light display showing the Armstrong Trap in first the open, and second, the closed position. Illuminated arrows will describe the operating cycle of the Armstrong Trap.



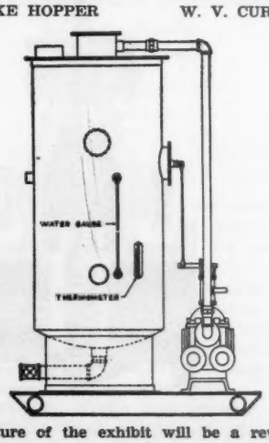
Also there will be a glass model of the Armstrong Trap working at 5 pounds steam pressure showing how the trap handles dirt and air as well as condensate. The company will display models of its forged steel traps for operating pressures up to 1,500 pounds gauge, and models of its compound, or piston operated traps for handling large volumes of condensate at low, medium, or high pressure. There will be a glass working model of its new foul gas purger for refrigeration systems.

Atlas Engineering Works
Houston, Tex.

Booths 424, 525, Coliseum

In attendance

ERNEST L. BARKER — J. R. BARRETT
JACK GARRISON — G. F. DUNNING
MIKE HOPPER — W. V. CURRIE



A feature of the exhibit will be a revolutionary design of boiler feed water heater as shown in the accompanying cut. Through use of this type of heater the costly heating of cold water in boilers as it comes from the pits is eliminated. Heating of the water is accomplished through use of the exhaust from either the drilling engine or boiler feed pumps. A feature of this heater is that an auxiliary pump is provided which provides a constant supply of water at an even temperature and size provides ease of handling when it is necessary that it be moved.

Other items that will be displayed by this company are christmas trees, tubing and bradenheads, high-pressure fittings and adjustable and positive chokes.

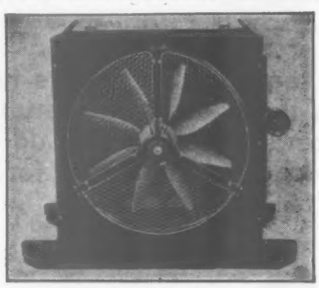
Atlas Supply Company
Muskogee, Okla.

Sections 1412, 1414, 1416, Annex

In attendance

H. U. EVERETT, district manager of Texas, Fort Worth
BEN L. JONES, Houston representative, Houston
BRUCE E. GOLD, engineer, Tulsa
J. R. BROOKS, vice president and secretary, Muskogee, Okla.
W. G. BURNSIDE, vice president, Steel Products Co., Iola, Kans.
E. TYLER DAVIS, assistant general manager of sales, Wheeling Steel Corp., Wheeling, W. Va.

Exhibiting Atlas No. 401 pumping unit, the smaller of two new sizes of shallow well pumping units recently introduced, and features a double reduction roller chain speed reducer. It has a 3.7-hp. reducer mounted on a front rated at 4,000 pounds capacity. It is equipped with roller bearings throughout. The unique method of chain adjustment will be of interest.



Driftmeter radiator cooling unit

The Driftmeter No. B63 radiator cooler is the smaller of eight new models of radiator coolers recently offered by Driftmeter, Inc., and ranging from 35-hp. to 90-hp. In the new models, the water pump has been placed on the outside to allow accurate proportioning of the pressure chamber depth. The same adjustable pitch, aeroplane type, propeller fan has been maintained because of its low horsepower consumption and high efficiency, although the use of a greater pitch angle has made it possible to reduce the normal speed. Only two frame sizes are used, and small coolers may be converted to larger capacity units within the limits of each frame size, with either clockwise or anti-clockwise rotation.

The Weber, Type "F" gas engine is being exhibited for the first time, a single-cylinder, two-cycle, vertical gas engine, with a 7½-inch bore and 9-inch stroke, rated 25 hp. at 550 r.p.m. The engine is equipped with a roller bearing crankshaft, centrifugal water pump, rotary magneto, and mechanical force-feed lubricator. New improvements include weatherproof construction, making an engine house unnecessary, and a special antiflooding valve and regulator.

Axelson Manufacturing Company
Los Angeles, Calif.

Booths 350-457, Frick-Reid Exhibit, Coliseum.
Booths 1630, 1632, 1634, Annex

In attendance

J. C. AXELSON, president; D. F. AXELSON, vice president; D. M. HAMMETT, vice president; A. G. HAGLUND, vice president; M. F. SMITH, sales engineer; E. W. BRANT, actory representative; P. I. LAYMAN, factory representative.

The exhibits will consist of a complete line of Axelson deep well plunger pumps, including the new Sure-Seal and Kup-Pak pumps. In addition the improved on-or-off attachment will be displayed. This unit provides a means of connecting or disconnecting the sucker rods as desired, thereby eliminating stripping jobs when the pump becomes sanded up or stuck.

The new Axelson heavy-duty standing valve puller, incorporating many new, desirable features, will also be included. The Axelson multiple standing valve with tubing bleeder will be shown. The arrangement of several relatively small A.P.I. valves working in parallel provides, the company says, a larger fluid capacity, less ball lift, faster valve action, and imposes a lighter load on each valve than is possible in the single large valve generally used. This unit, in addition to being an effective valve, provides a convenient means of bleeding the tubing without pulling the rods or tubing.

The new Axelson full-floating stuffing box will be shown in detail. Axelson sucker rods, couplings, the improved sucker rod guides, and the new Axelson No. 70 single joint pull rods will also be displayed.

The pump and accessory display will be in the Frick-Reid exhibit—Booth 350 to 457, in the Coliseum. Axelson is also exhibiting 14-inch and 24-inch heavy-duty lathes, designed and built completely by the company. Actively engaged in the designing and manufacturing of lathes for more than 20 years, the company now displays its latest and most complete line of lathes. The lathe exhibit will be in Booths 1630, 1632, and 1634 on the ground floor annex.

Ayres Engineering Co.
Houston, Tex.

Booths 409, 411, Coliseum

Baash-Ross Tool Company
Los Angeles, Calif.

Booths 512, 514, Coliseum

In attendance

L. F. BAASH, president
H. C. ROSS, vice president
A. F. BROWN, vice president
H. J. CRAIG, manager, Mid-Continent division
NOEL DALTON, salesman
GENE BUCKNER, salesman
C. B. CAROTHERS, field service
O. E. DeLANGE, salesman
H. B. SLAYBACK, salesman
K. K. CAMPBELL, engineer
G. ALLEN SPELTS, engineer

Equipment to be exibited: Tubing spider, wire line oil saver, rotary slips, tubing block, casinghead, Spelts cylinder.

Baker Oil Tools, Inc.
Huntington Park, Calif.

Booths 100, 101, 102, and 201, Coliseum

In attendance

T. SUTTER, general manager
C. E. BURT, chief engineer
G. M. ANDERSON, sales engineer
C. E. WHITNEY, manager Houston division
W. A. DAVIS, Houston, district manager
W. E. ROUTT, sales engineer, Houston
W. H. GRIFFIN, sales engineer, Houston
J. H. GRUBB, sales engineer, Shreveport, La.
W. T. CROWDER, petroleum engineer, Longview, Tex.
R. S. KAIL, petroleum engineer, Houston, Tex.

Model K cement retainer

A cutaway model of Model K cement retainer will demonstrate the new hydraulic tripping principle which eliminates the use of a separate tripping assembly. A large-scale drawing will illustrate the setting procedure and use of this tool for cementing and as a bridge plug.

Another important feature is the ball back-pressure valve which provides an immediate and positive valve closure following the setting of the retainers.

The company's new line of Duplex cement guiding, floating and cementing equipment includes various types of shoes and collars for perfecting two-stage cementing jobs, and for the lower two jobs in a series cementing operation; for cementing liners, combination strings and oil strings, either at the shoe or up the pipe; and for single cement jobs requiring high-pressure.

Bakwik Model "B" drill pipe float, the newly de-

signed straight bore body contains a valve assembly constructed entirely without threads, being dropped into place in the "float joint" or body. When an unrestricted passage through the float joint body is desired, the valve assembly can be lifted out by hand.

Drill pipe float

A model of the company's regular cement wash-down whirler float shoe will demonstrate how this shoe facilitates running of casing where bridges or other formation obstructions may be encountered. It can be used to wash formations preparatory to cementing, and it is said insures the best possible encasement of the pipe with a uniform body of cement. Fluid pumped down through the shoe and out the wash-down whirler side ports, is directed downward at an angle sufficient to produce a whirling motion. When bridges are encountered while running in, the hydraulic or jetting action washes away the sides of the bridge.

Bailey Meter Co.
Cleveland, Ohio

Booth 1324, Coliseum

In attendance

H. M. HAMMOND, manager of sales and engineering, and C. M. KUNKEL, manager of Houston branch office.

An exhibit of meters and controllers, together with diagrams illustrating their application for the control of tube-still furnaces in accordance with temperature, in situ density, yield-per-pas.

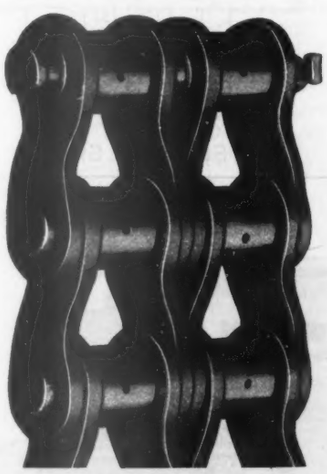
Baldwin-Duckworth Chain Corporation
Springfield, Mass.

Booths 314, 316, Coliseum

In attendance

F. J. WESCHLER, general manager
G. D. GILBERT, sales manager
HERMANN KLAUCKE, chief engineer, Baldwin division
J. F. McCANN, chief engineer, Duckworth division
A. T. ARNOLD, advertising manager
G. J. FIX, Mid-Continent representative
G. J. FIX, JR., salesman
KENNETH MILLS, salesman
J. H. TURNER, salesman

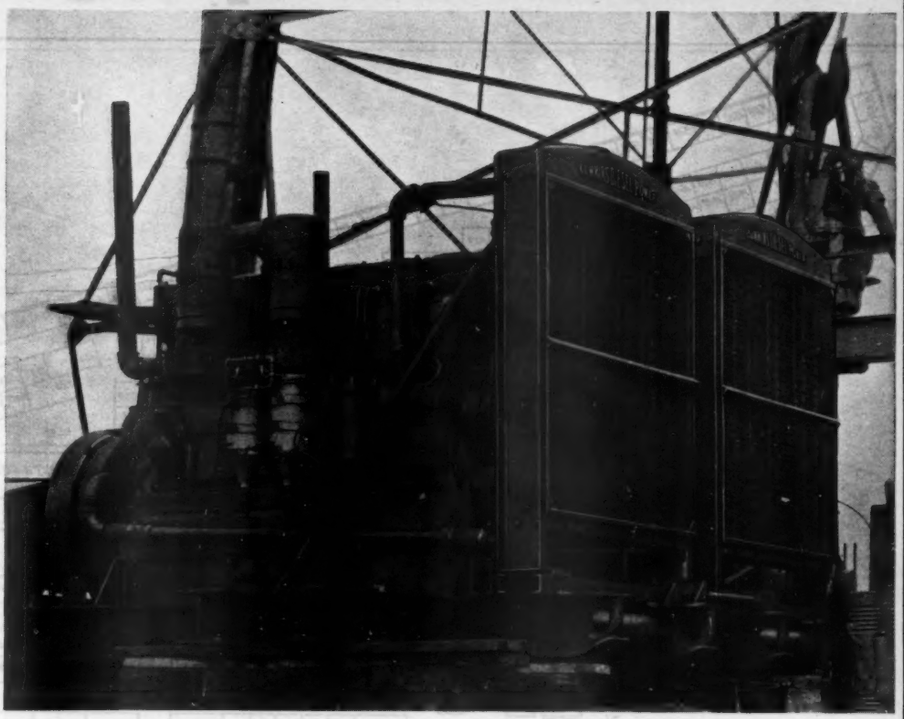
Special feature will be the company's D.P. (Dual Purpose) rotary chain, 3⅛-inch pitch No. 3125 and D3125, developed during the past year. The D.P.



chains are not interchangeable with either A.P.I.-3 or A.P.I.-4. The pitch, shorter than either A.P.I. Standards, accommodates higher drilling speeds. These chains are built specifically for the oil field. They are designed to serve two purposes, use on rotary rigs of conventional type and use on unitized transmissions, either Diesel or Diesel-electric driven.

PERFEX RADIATORS *Predominate* IN OIL FIELD SERVICE

SEE MID CONTINENT SUPPLY CO.



Basic design and construction advantages provide wider water pass and freer air flow—two *good* reasons for Perfex oil field predominence . . . and being industrial radiator manufacturers *exclusively,* Perfex engineers know how and what to build for heavy duty service.

PERFEX CORPORATION • MILWAUKEE, WISCONSIN

Bantam Bearings Corp.
South Bend, Ind.

Booths 1110 to 1112, Coliseum

In attendance

R. B. NICHOLS J. F. OEHLHOFFEN
S. R. THOMAS C. A. BENSON

There will be a large assortment of Bantam quill bearings including a cross section (cut away) quill bearing. Also miscellaneous groups of ball thrust bearings miscellaneous rollers parts and other parts of assemblies including assemblies and complete journal roller bearings. There will also be several angular contact bearings and a complete display of bearings manufactured by the parent firm, the Torrington Co. of Torrington, Conn. Illustrated is the Bantam quill bearing, a comparatively new development, which has received widespread applications in the oil field. It has been adopted by a number of leading manufacturers and is being used in the center iron saddle and the upper and lower pitmans of oil pumping units, also in crown blocks. The company says the quill bearing offers as a most important characteristic high load carrying capacity in limited areas, ease of installation, and a special construction which causes no load to be placed upon the trunnions. The retainer functions only during assembly.

Baroid Sales Department (National Pigments and Chemical Division of National Lead Company)
Los Angeles, Calif.

Booths 224, 325, Coliseum

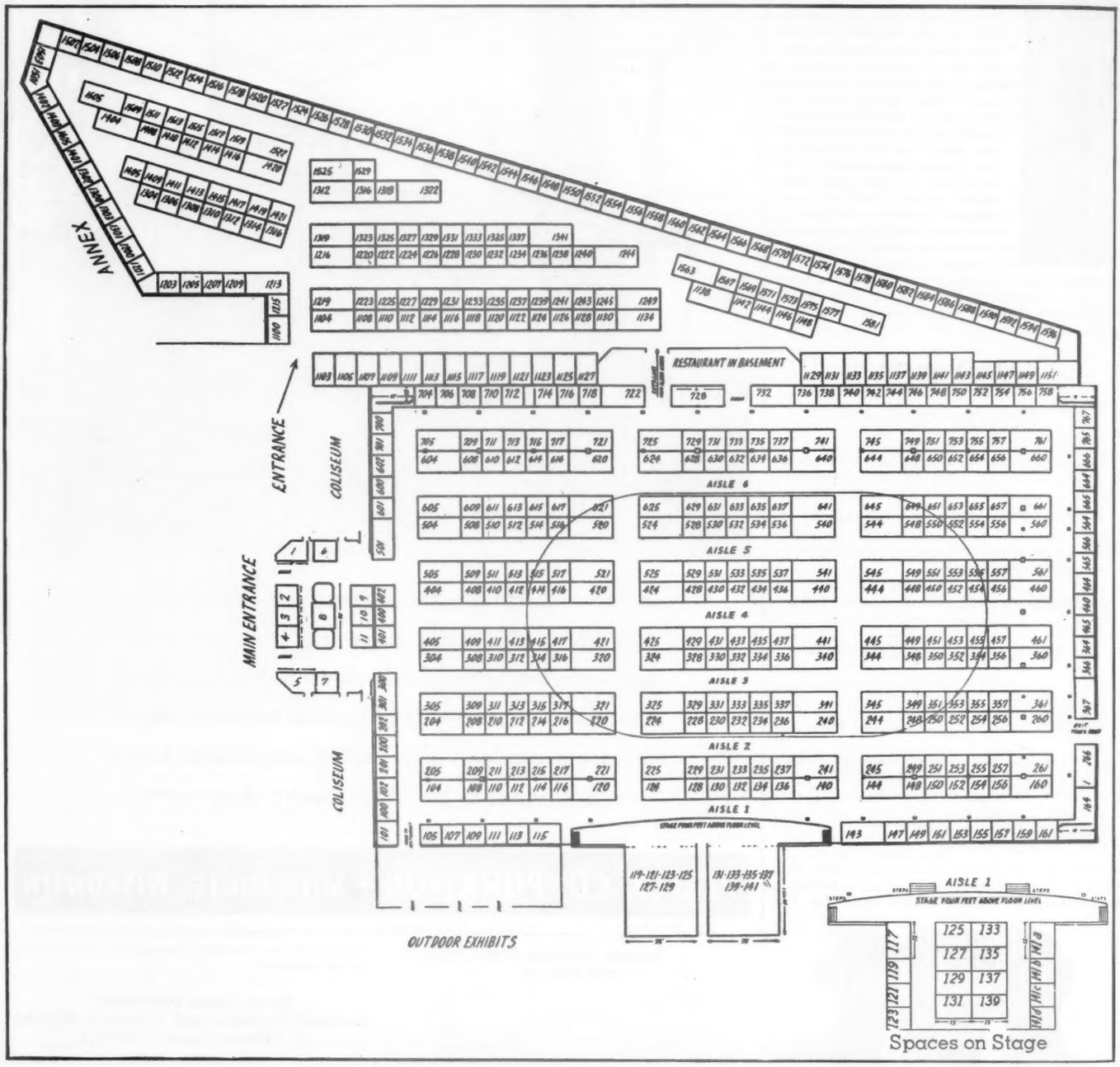
In attendance

GEORGE L. RATCLIFFE, general manager
D. A. SIKES, Mid-Continent district manager
H. H. FARNHAM, Gulf Coast district manager
E. C. MEYER, advertising
WARDE EVANS GEORGE MOORE
F. E. PALMER J. M. BUGBEE
R. W. WILSON C. W. SULZER
G. C. WAHLSTROM

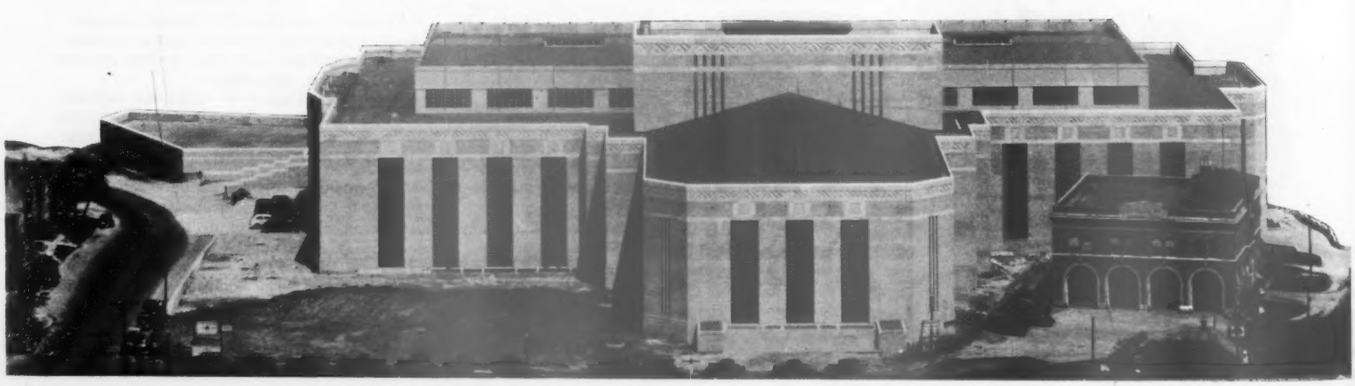
New equipment: Baroid high-pressure high-temperature wall-building tester, designed to investigate the wall-building properties of drilling muds at elevated conditions of pressure and temperature in order to approximate the existing well conditions to which a mud is subjected. The company states it will withstand pressures up to 1,000 pounds per square inch with a temperature control up to 212° F. and because of its design affords simplicity and portability to en-

(Continued on Page 142)

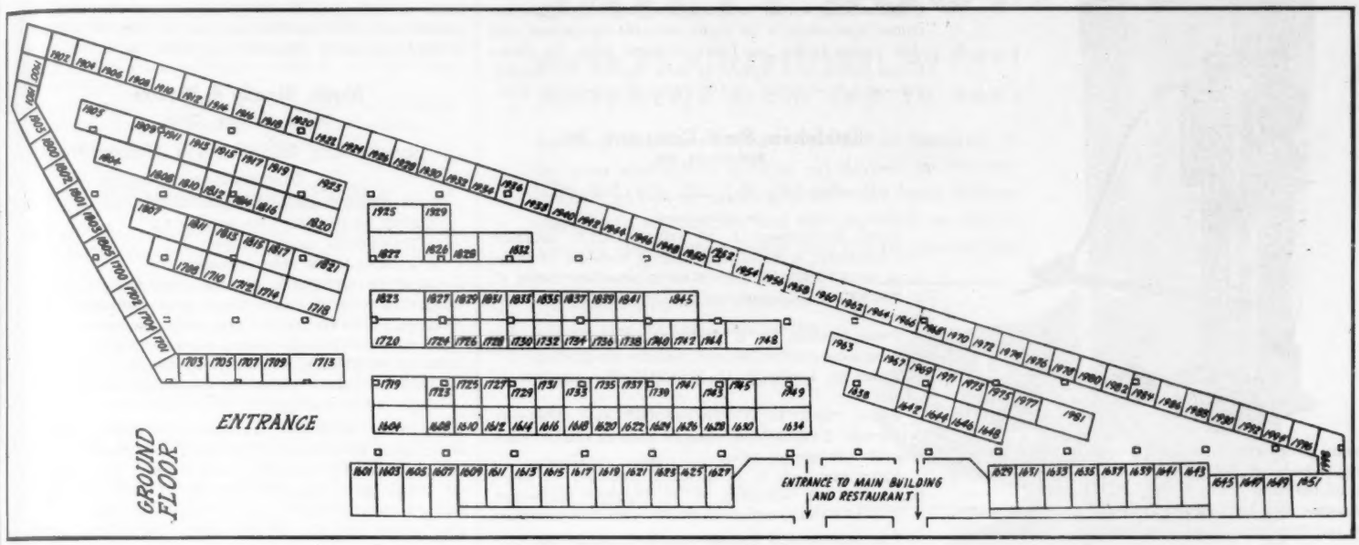
Oil-World Exposition Facilities



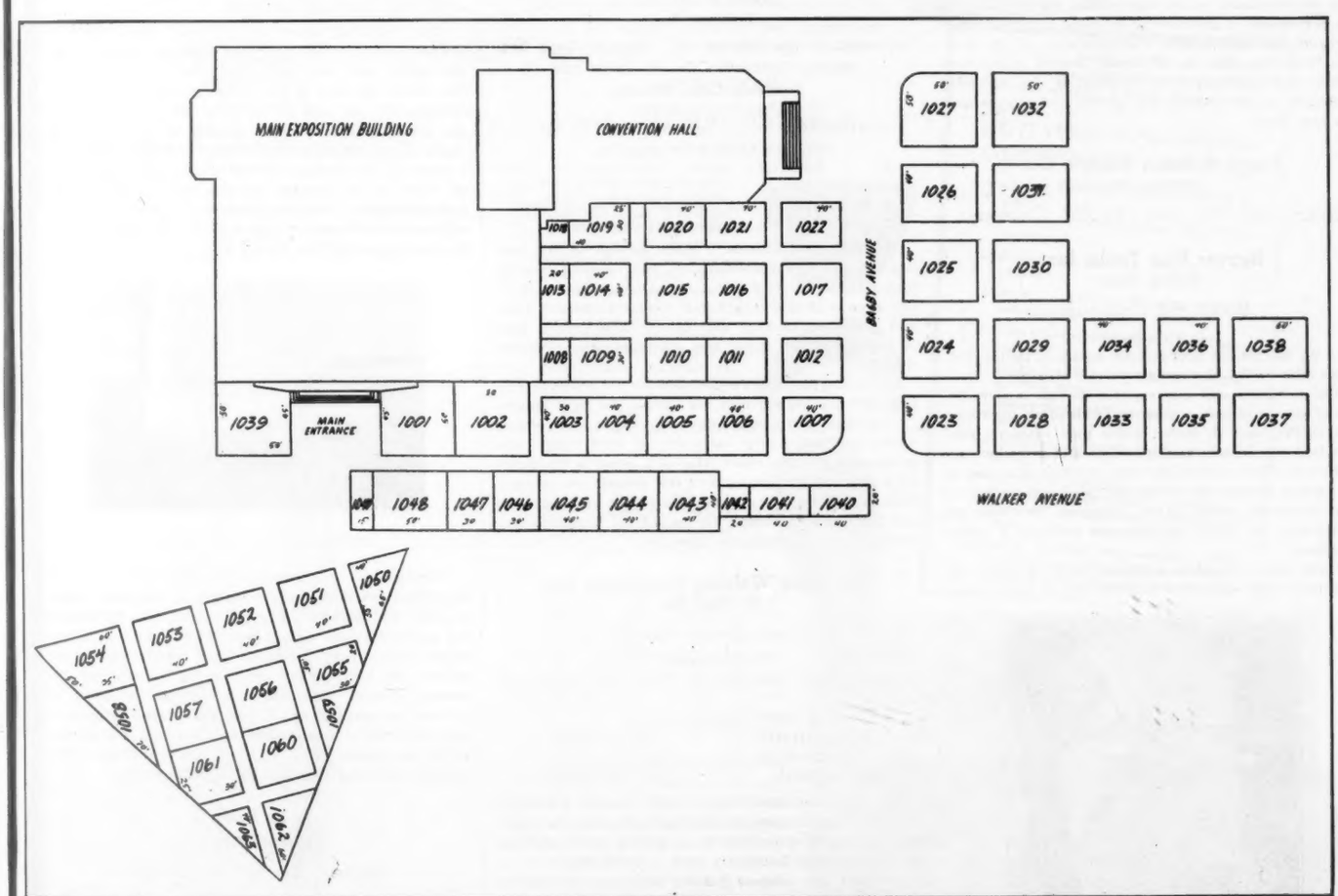
MAIN FLOOR COLISEUM AND EXTERIOR VIEW



Greatly Enlarged for 1939 Show



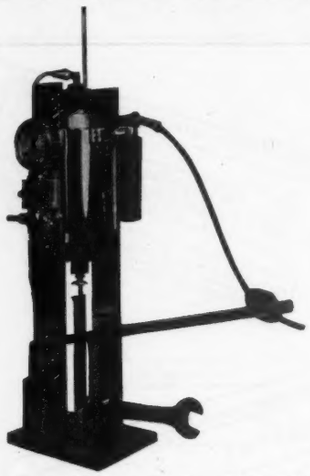
GROUND FLOOR COLISEUM ANNEX



OUTDOOR SPACE

During the past year a new steel and concrete annex has been built to the Municipal Coliseum in which the exposition is held. This has added more than 90,000 square feet of indoor space, practically all of which has been filled, as well as the substantially larger outdoor space which has been provided for the heavier and bulkier machinery

able its use for field testing as well as laboratory testing. It consists essentially of a filter cell fitted into a bath and a screw press, the unit does not require any extra pressure equipment. Built right on the tester are a water reservoir, small hydraulic pump for furnishing the pressure, check valve, 1,500-pound



pressure gauge and a by-pass valve all of which present a simple and compact arrangement for providing pressure on the mud.

Another new product introduced in 1939 is Disperso. This has been developed as a material to recondition cement-cut mud, or to prevent mud from becoming cement-cut. It is stated Disperso not only counteracts the effect of cement-cutting, but frequently as a result of the treatment the mud displays better performance characteristics than it did originally, because included with the substance which counteracts the calcium ion is a percentage of gel-forming colloidal material which increases the wall-building characteristics of the mud. This treatment has in all cases proved economical in cost and time saved by eliminating the necessity to discard all the mud in the system and change over to a new mud.

Beard & Stone Electric Co.
Houston, Tex.

Spaces 105, 107, 143, 145, 657, Coliseum

Beaver Pipe Tools, Inc.
Warren, Ohio

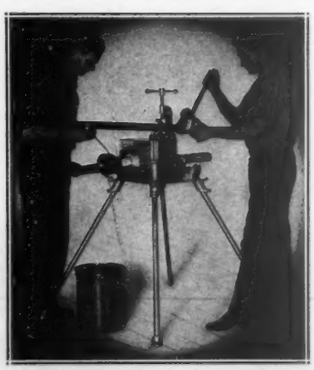
Booth 754, Coliseum

In attendance

C. W. SMITH, oil field district manager, Dallas, Tex.
AVERY PHILLIS, Chicago district manager

The company will demonstrate its full modernized line of pipe and bolt cutting and threading machines; pipe cutting and threading tools; pipe reamers; sawing vises; nipple chucks; pipe vises and miscellaneous equipment. This modernized line consists of a tool to meet every cutting and threading need and preference from one-eighth to 12 inches, inclusive. The tools are used either by hand or with the company's power machines.

Hand pipe threaders exhibited will be both the taper-post type wherein a separate set of dies is used



to thread each different size of pipe within the range and the self-contained and adjustable type which thread all sizes of pipe without changing dies or bushings, and which are adjustable to cut over or under size as well as standard threads. The hand pipe cutters will be both the square-built wheel-and-roller type from one-eighth to 4 inches and the burrless type from one-eighth to 12 inches, which cuts pipe square without burrs and lathe-like cutting knives. Swivel and ratchet type reamers from one-eighth to 3 inches will be on display.

The feature attraction will be the company's Model C portable pipe and bolt threading machine. This machine, illustrated, is an easily portable low-priced unit that makes power machines of hand tools. Its range is one-eighth to 8 inches in both cutting and threading—and one-quarter to 1½ inches in threading bolts.

Bethlehem Steel Company, Inc.
Bethlehem, Pa.

Booths 548, 550, 552, 554, 556, 560

In attendance

From Bethlehem: J. V. HONEYCUTT, assistant vice president; J. M. ELLIS, general manager of sales; E. A. BUXTON, manager of sales, pipe and tubes; C. R. ZIMMERMAN, salesman; T. J. FITZGIBBONS, salesman.

From Detroit: W. B. TOPPING, general manager, western sales.

From St. Louis: B. C. MacGREGOR, manager of sales.

From Tulsa: G. A. THOMPSON, vice president, Bethlehem International Supply Co.; R. G. AYERS, general manager of sales.

From Houston: J. E. MOORE, manager of sales; E. C. CRIDER, salesman; E. F. SEAMAN, salesman; A. B. HARRISON, salesman; T. R. MILLER, salesman.

The exhibit will include seamless casing and tubing; sucker rods; alloy and corrosion resisting bolting material; wire rope and strand; tool joints; pump liners; Mayari R, high strength, low alloy steel.

Bettis Sales Co.
Houston, Tex.

(Representing Pyle-National Co., Chicago; Beck Engineering Combustion Co., St. Louis; and Texsteam Corp., Houston)

Booths 1405, 1409, 1411, Annex

In attendance

R. L. KILKER, factory representative, Pyle-National Co.
A. H. JOHNSON, vice president, Texsteam Corp.
J. M. SHEESLEY, president, Bettis Sales Co.

Exhibits will include a cross section of the new line of oil field turbo-generators and turbines recently introduced by Pyle-National Co. Among these will be the Type R-12 KW single unit generator, largest item, and a one-half to 2-hp. gas turbine. Also several sizes of floodlights and vapor and explosion-proof electrical fittings.

Beck Engineering Co. will exhibit its Melloblu low-pressure gas burner unit for 125-hp. oil field boilers.

Texsteam Corp. will show its recently introduced nickel seat safety pop valve for oil field boilers and production gas line relief. Also of interest is its chemical injector that operates on a few pounds gas or fluid. This, it is stated, is an inexpensive yet very accurate and simplified machine for positively proportioning chemical for oil emulsion treatment.

Big Three Welding Equipment Co.
Houston, Tex.

Booth Space 735-741

In attendance

B. K. SMITH, president; B. J. BRUGGE, sales manager.

Sales representatives:

A. K. SMITH	H. K. SMITH
L. L. DAIGLE	G. B. DENNEY
A. W. BENN	R. F. HODGES

Products exhibited: Full line of Lincoln Fleetweld electrodes and accessories. Descriptive matter on every new or improved product to be shown (only products introduced since January 1, 1938, are eligible).

Lincoln 500 ampere S.A.E., 180 cycle alternating current motor generator type welder equipped with induction heating coils for preheating and stress relieving alloy and heavy wall high-pressure high-temperature pipe welds in the field.

This equipment offers efficient trouble-free stress relieving methods at low cost for field use. S.A.C. welding machine can be used for regular welding duty when not used in stress relieving pipe welds.

Complete line of Lincoln Diesel driven welders for pipe line and construction work where electric power is not available. Complete line of new Lincoln, light weight low cost welders with unburnable insulation.

New Lincoln S.A.E. featuring dual continuous control with indicating dials. This new indicating dial makes it possible for welders or supervisors to adjust proper welding and characteristics from a large easily readable dial. Production speeds can be increased considerably and penetration and arc factors chosen to give maximum efficiency for each job.

Black, Sivalls & Bryson
Oklahoma City, Okla.

Spaces 450, 452, 454, 456, Coliseum

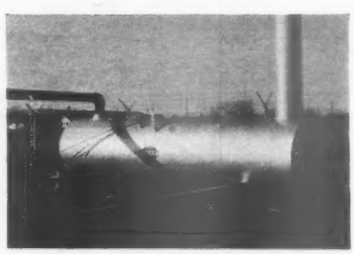
In attendance

A. H. BLACK, president
GLENN SKINNER, vice president
G. RAYMOND, chief engineer
A. J. EDWARDS, sales manager
GURNEY PEOPLES, division manager
R. E. STEVENS, South Texas sales manager
H. R. BETHEL, West Texas sales manager
H. B. FESSLER, Louisiana sales manager
G. C. PARMLEE, sales representative
GEORGE SMITH, sales representative
L. M. TIDD, treasurer

Products exhibited: Automatic chemical feeder: safety-head; flow pressure regulator; 1,500-pound working pressure A.P.I.-A.S.M.E. code oil and gas separator; 125-pound working pressure A.P.I.-A.S.M.E. oil and gas separator; tubular treating heater; horizontal fire tube heater; pipe line oil seal valve; "Long John" thief valve; diaphragm operated back-pressure gas valves: pilot controlled oil valves; equalizing thief valve; riser type vent valve; straight through vent valve.

The company's tubular treating heater is designed similarly to a refinery pipe still and is especially adapted to treat corrosive emulsions.

The company states its oil seal valve, installed downstream from the pipe line opening in lease storage tanks, will accurately and consistently shut off flow from the tank a few inches above the pipe line opening and prevent air flowing into the pipe line, and also eliminate manual shut-off of the tank. The "Long John" thief valve, having inside dimensions of 8 inches by 22 inches, will, it is said, allow the longest thief to be handled without spilling oil on the decks of tanks. Consistent mechanical stop-cocking of wells which eliminates human labor and error, is stated to be accomplished by the flow pressure regulator.



Horizontal fire tube heater

Throughout this heater, it is stated, precautions have been taken to prevent burnouts, facilitate cleaning out, and maintain high efficiency. No horizontal flat plates are used as heating surfaces and this eliminates spots where sediments can collect and cause failure. The temperature controller gives efficient automatic control. The whole length of the shell is utilized for settling space, and the overall height of approximately 3 feet makes erection and connection work convenient. Two 4- by 6-inch handholes give adequate opening for cleaning out the heater.

J. E. Bobo
Houston, Tex.

Spaces 533, 535, Coliseum

Exhibiting display of the products of three of the manufacturers represented in the Mid-Continent oil fields. Display for Marshalltown Manufacturing Co. will consist of its line of pressure gauges, many of which have been developed especially for oil field service. Display of the products of Dixon Valve and Coupling Co. will present its complete line of rotary hose couplings and other types of couplings. Display

of products of Alten's Foundry and Machine Works will consist of its iron body stop cocks, check valves, stuffing boxes, etc.

Bonney Forge & Tool Works
Allentown, Pa.

Booth 1417, Annex

In attendance

FRED S. DURHAM, president; ARTHUR J. MALE, secretary and treasurer; JEAN DU BOIS, sales manager Forged Fittings Division; RON H. WIXSON, sales representative.

Exhibiting a full line of hand tools and Bonney WeldOlets and ThredOlets—drop-forged welding fittings for making branch pipe outlets.

No. 66 Bonney Torque-Indicating Wrench—for obtaining uniform tension on series of bolts and nuts.

Included in the display of hand tools will be a full line of sockets with detachable handles and attachments for one-quarter inch, three-eighths inch, one-half inch, three-quarters inch, and 1-inch square drive. Box wrenches with hexagon and double hexagon openings in miniature, standard and heavy duty sizes to take care of nuts from three-sixteenths inch to 2½-inch. Open end wrenches with openings at 15-degree angle, ranging in sizes from one-quarter inch to 1⅝-inch and having length of from 3 inches to 15½ inches, depending upon the size opening.

Bonney TuType wrenches, combining an open end and box wrench in the same tool with openings from three-eighths inch to 1 7/8-inch and ranging in length from 5 inches to 21 inches. There will also be shown a full line of soft face and ball peen hammers, pliers, screw drivers with handles that are nonconductors of electricity—as well as regulation wood handle types. Pliers, in a variety of types, as well as an assortment of punches and chisels, will also be shown.

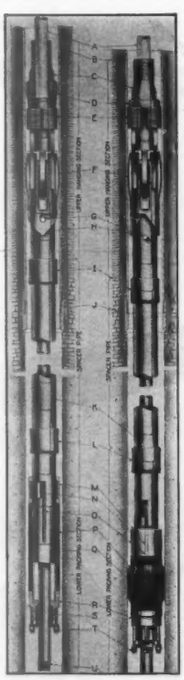
H. E. Bowman Co.
Houston, Tex.

Space 2

The Brandon Company
Odessa, Tex.

Space 1403

Show new type packers made by Exner-Dodge Packer Co., of Coffeyville, Kans. Stress will be laid on the new underset formation packer that hangs in the



well casing and packs off in the formation, and can be moved up and down to find best pack off point; also made to give a double pack off several feet apart. The super hook wall tubing packer with re-

(Continued on Page 148)

NEW "OIL-FIGHTER" SAFETY BOOT

made of oil-resistant du Pont NEOPRENE from top to toe:

Petroleum engineers already know du Pont Neoprene as the most satisfactory material yet devised for the construction of belting, packing, gaskets and hoses that are exposed to oil, gasoline and solvents which quickly rot ordinary rubber Now Lehigh uses this remarkable substance to make a safety boot that will really WEAR under these conditions, and that provides for the petroleum worker, the toe protection that is imperative for all workmen who handle heavy materials.

Falls caused by slipping on oily surfaces, and toes crushed by dropped tools and equipment account for more than a fourth of all injuries in the petroleum industry . . . and Lehigh "Oil-Fighters" are designed efficiently to combat both hazards. Write us today for complete facts, prices, and a convincing on-the-job demonstration . . . or, while you're at the Exposition, stop in to see

ART SULLIVAN
Lehigh Representative
525 Chronicle Building • Houston, Texas
or Booth 1575A at the Exposition

1120—Super quality, heavy duty, black Neoprene knee boot. Not carried in stock. For makeup only, in whole sizes 5 to 12.

NOTE THESE OUTSTANDING CONSTRUCTION FEATURES:

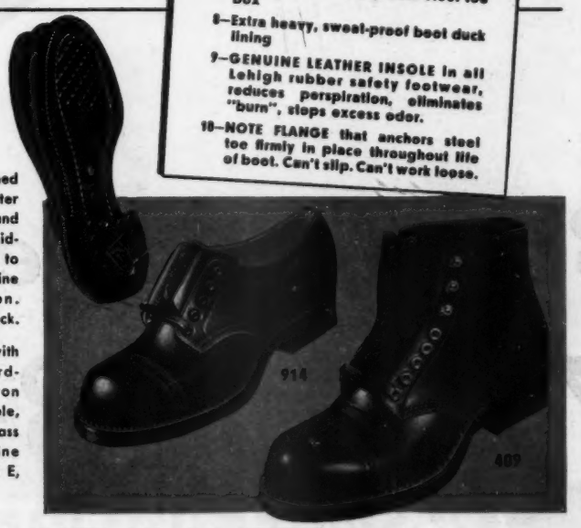
1—Strong binding prevents tearing at top
2—"Layered" construction for super service
3—Reinforced counter, shaped to FIT at heel
4—Wide, moulded Neoprene heel wears longer
5—Sole vulcanized to upper. Can't tear loose
6—Extra heavy, 14-iron, anti-skid cleated sole
7—Heavy Neoprene cap over steel toe box
8—Extra heavy, sweat-proof boot duck lining
9—GENUINE LEATHER INSOLE in all Lehigh rubber safety footwear, reduces perspiration, eliminates "burn", stops excess odor.
10—NOTE FLANGE that anchors steel toe firmly in place throughout life of boot. Can't slip. Can't work loose.

THIS IS THE STEEL TOE BOX used in all Lehigh rubber safety footwear. It is high carbon, cold-rolled steel (armorplate), of minimum density—B scale 42 (Rockwell Test). Average compression required to crush toe box down to ¼-inch free height (minimum for toe clearance) is 5,878 lbs. In actual use, we have authenticated instances in which it has withstood direct impacts of from two to seven tons.

"OIL-FIGHTER" SHOES with NEOPRENE SOLES are also available:

409—Eskimo calf blucher, oil tanned one-piece vamp, vamp and quarter unlined, full Neoprene outsole and heel, chrome-tanned leather middlesole, two brass rivets shank to sole for added strength. Genuine Goodyear welt construction. Widths D and E, sizes 5 to 12 in stock.

914—Black elk blucher oxford with 14-iron, anti-skid sole of cord-moulded-in-Neoprene. 4-iron chrome tanned leather middlesole, steel arch supporting shank, 2 brass rivets shank to sole. Genuine Goodyear Welt. Widths D and E, sizes 5 to 12 in stock.



Write for complete catalog of Lehigh Safety Shoes built for all industrial needs

LEHIGH SAFETY SHOE CO. ALLENTOWN, PA.

BE SURE TO SEE IT!

at the

OIL-WORLD EXPOSITION

in

HOUSTON

April 24-29

Booth Numbers

716–718–720–722

THE COLISEUM

OSTER
THREADING EQUIPMENT
WILLIAMS

● The biggest, toughest, huskiest machine in the great OSTER-WILLIAMS line, the No. 8-XHD . . . Extra Heavy Duty . . . RAPIDUCTION Bucking-Up and Threading Machine.

Especially built and engineered to meet any test the oil industry can offer it, its threading capacity is 2½" to 8⅝" and it can throw 30,000 foot-pounds torque against tool-joints and flanges.

Get the complete story in a special bulletin.

THE OSTER MANUFACTURING COMPANY

Sales Office: 2046 East 61st Street, Cleveland, Ohio • *Factories:* Erie, Pennsylvania, and Cleveland, Ohio
New York City Showroom and Office, 292 Lafayette St. • Philadelphia Showroom and Office, 111 North 3rd St.
Threading Headquarters Since 1893

DEVIL-DOG
OIL WELL CHAINS

FOR DEEP WELL DRILLING

Whether drilling shallow or deep, in hard or easy going, you will find it money-saving practice ALWAYS to use a better class of oil well chains . . . such as the Jeffrey Devil Dog series.

Built to the standards of the American Petroleum Institute, you will find in these chains plus-values derived by discriminating selection of alloy steels, balanced construction without excess weight, and precision manufacture. Try a better chain on your next job . . . ask for DEVIL DOG.

Careful boxing with easy-to-read labels, assures clean chain and facilitates handling and storage.

Visit our display of Chains, Shale Shakers and Feeders in Booths 659-661.

THE Jeffrey MANUFACTURING COMPANY
891-99 North Fourth Street, Columbus, Ohio
★ IN TEXAS: 6358 Auden Street, Houston.

STAHMER SPECIALIZES IN
WOOD SOLE SHOES

"SPECIALIZING FOR THE OIL INDUSTRY" means building a shoe that will protect your employees from serious foot injury—as well as accidents or sickness from slippery, unhealthy underfoot connections. Comfort and durability are important, too. DAVENPORT Wood Sole Shoes are designed to meet all of these demands.

The tough maple sole assures firm footing and the waterproof upper keeps the feet dry and comfortable. Then, too, these shoes are inexpensive and will outlast other types of footwear. That's why DAVENPORT Wood Sole Shoes are the complete answer to *safety* and comfort for workers in the oil industry.

WRITE TODAY FOR **FREE** *Davenport Wood Sole Shoe Manual*—guide to foot protection and shoe economy.

F. J. STAHMER SHOE COMPANY
2353 BOIES AVE., ... DAVENPORT, IOWA
"World's Largest Exclusive Manufacturer of Wood Sole Footwear."

movable top and element, will be shown, also a new noncorrosive finish being used inside all E&D fittings, such as swedges, bull plugs, casing nipples, resistance to sulfur and salt water corrosion.

Will have representative lines of Norris Bros., Inc., of Robinson, Ill., pumping equipment, turnbuckles and other items, and representative line of Baird Manufacturing Co. balls and seats, drop and seats and sucker-rod taps and dies; and samples of Diamond chain.

Brance-Krachy Co., Inc.
Houston, Tex.

Booths 1216, 1218, 1319, 1321, Annex

In attendance

J. D. BRANCE — A. C. KRACHY
L. J. WALLACE — TOM EVANS
C. J. MUELLER — G. W. KING
E. G. SPARGO — G. R. GLASS

Exhibit will consist of equipment for the transmission of electrical power and mechanical power, and will be furnished by several manufacturers which the company represents. These manufacturers are:

Louis Allis Co., electric motors. Electric Machinery Manufacturing Co., generators. Moloney Electric Co., transformers. Cornell Dubilier Electric Co., capacitors. Falk Corp., gears and flexible couplings. Whitney Chain & Manufacturing Co., chain and sprockets. Norma Hoffman Bearings Corp. Reeves Pulley Co., variable speed transmissions.

In addition will display various types of units for the cathodic protection of pipe lines.

The Bridgeport Machine Company
Wichita, Kans.

Spaces 1010-B, 1015

In attendance

B. B. ROOT, vice president and general manager
L. A. BABB, vice president and sales manager
F. K. BLAUVELT, vice president and plant superintendent
L. V. BROWN, assistant sales manager
R. W. WALTERS, superintendent of sales
J. W. WILEY, chief engineer
FRED PARKS, manager of stores
F. R. HOUSE, manager, Dallas office
J. M. WELCH, manager, San Antonio office
W. H. TURNAGE, Houston manager
E. H. BUTLER, Houston sales representative
I. C. LAWLESS, publicity director

The exhibit will be of especial interest to drilling contractors and production men because practically all of the equipment shown has been developed during the past 18 months. Included in the equipment is the company's new chain-driven pumping unit said to embody a number of advanced features in pumping equipment design. This new unit has been field tested for months and will be placed on the market shortly after the oil show.

The company's well servicing unit, demonstrated for the first time at an oil show, will be in operation. This unit is made in both the single-drum and double-drum design and both types will be rigged up and in operation so that interested parties may examine them in detail and get the "feel" of operation.

The Bridgeport-Pratt portable oil treater, which has been on the market for several months, will also be demonstrated, as well as the company's new portable rotary drilling rig which is especially designed for shallow and medium depth drilling. The complete line of gumbo buster drilling machinery, including a new 17½-inch fully enclosed, roller bearing rotary, the FC-200 drawworks with built-in transmission, a new power pump, the rotary drive transmission and several other items of brand new gumbo buster equipment will be demonstrated for the first time at an oil show in the Bridgeport equipment display.

Briggs Clarifier Co.
Washington, D. C.

Booth 1569

In attendance

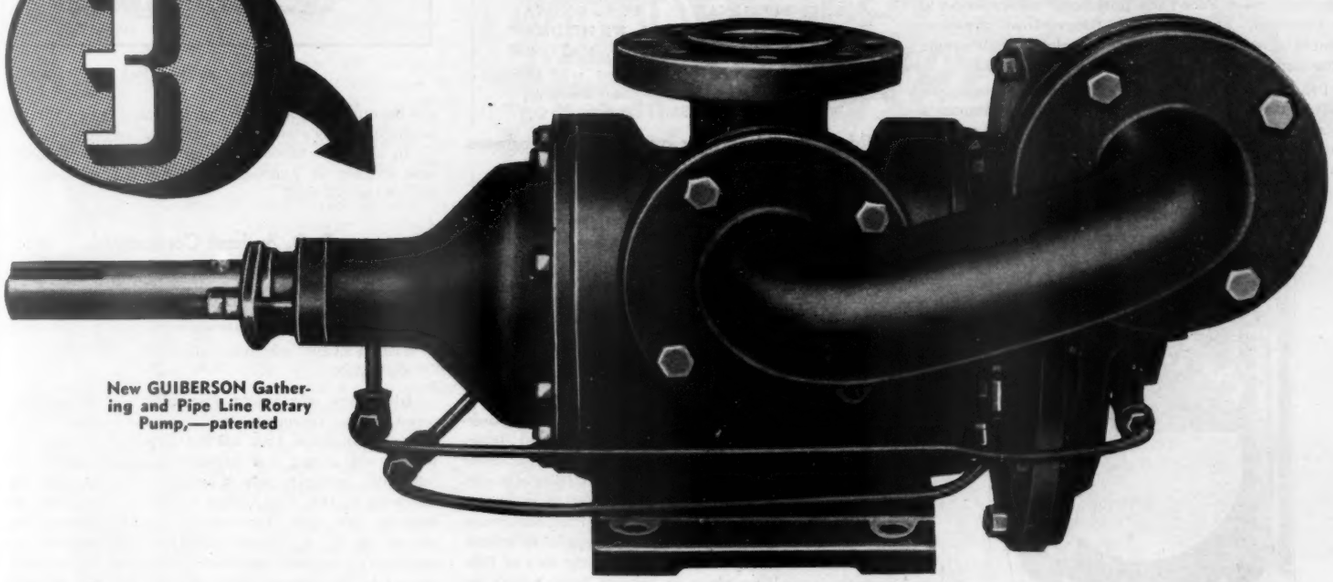
DUNMAN PERRY, field engineer
ROBERT G. TAYLOR, field engineer
WALTER A. FRAZIER, sales representative
A. C. STANFIELD, sales representative

Equipment displayed will consist of Model D-2 Clarifier cutaway to show construction details. This clarifier

(Continued on Page 152)

See these three Guiberson Items!

3



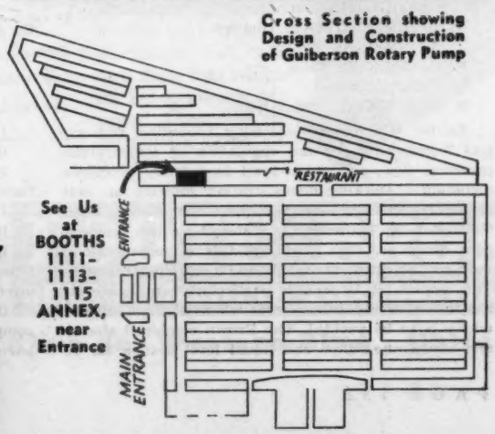
New GUIBERSON Gathering and Pipe Line Rotary Pump,—patented

Every GUIBERSON specialty has marked an advance in efficiency, economy, and safety, in the field in which it was introduced.

These newest GUIBERSON products are not exceptions to this rule. The Guiberson Flow Valve has a record of 100% perfect performance, on every well on which it has been installed. A Guiberson Bottom Hole Intermitter has recently been introduced, with the same record of performance. The Guiberson Drilling Head, now declared free of infringements, provides a rotating, leak-proof pack-off between kelly or drill pipe and casing and makes possible the completion of wells without blowouts, using no other additional equipment. The Guiberson Rotary Pump is definitely reducing costs and simplifying the problems of gathering and pipe line pumping.

The Oil Show offers you an opportunity to learn the facts about these products and about GUIBERSON Swabs, Tubing Catchers, Spiders, Packers, Oil Savers for Tubing, Sucker Rods and Wire Lines, Bottom Water Plugs, etc. Three distinct divisions of GUIBERSON Tools—drilling, producing, and pipe line—will each be represented by competent and experienced sales engineers, who will gladly explain their tools and discuss your problems.

Cross Section showing Design and Construction of Guiberson Rotary Pump



See Us at BOOTHS 1111-1113-1115 ANNEX, near Entrance

THE GUIBERSON CORPORATION . . BOX 1106, DALLAS, TEXAS

Tulsa, Okla. Kilgore, Tex. Kermit, Tex. Houston, Tex. Salem, Ill.
Newark, O. Denver, Colo.
Los Angeles: The W. R. Guiberson Co. Export: I. Frank Brown, New York City

BERSON

is for the clarification of lubricating and fuel oil in stationary Diesel and natural gas engines.

A model D-1 Clarifier also suitable for either fuel or lube oil clarification in stationary engines will be shown.

In addition, there will be a Briggs Model F-5 Fuel Oil Clarifier suitable for Diesel engines having a maximum fuel consumption of five gallons per hour.

Cutaway sections of G-600 and G-800 lube oil Clarifiers for heavy duty gasoline engines and light Diesels will be shown along with photographs of actual Briggs Clarifier installations in all types of service.

The Bristol Company

Waterbury, Conn.

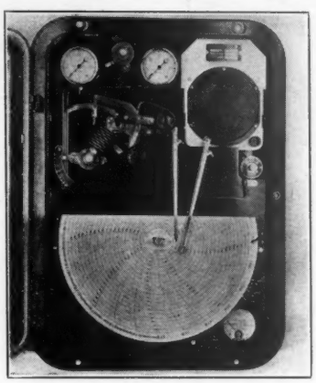
Booth 1, Coliseum

In attendance

H. E. BEANE, field sales manager
A. A. BLACKMAN, St. Louis district manager
E. L. STILSON, special sales engineer for petroleum industry
H. A. VAN HALA, Birmingham district manager
E. H. HART, development engineer
D. D. AULT, sales engineer
R. A. BARNES, sales engineer

Instruments used in oil refineries—featuring the company's reset Free-Vane pneumatic controller—will be exhibited. These are for temperature, pressure, vacuum, flow or liquid level and equipped with simple throttling-range and automatic-reset adjustments.

In operation will be a remote-set pressure controller, demonstrating the use of the company's Metameter system of telemetering for remote control. The Pyromaster round-chart potentiometer will be shown with a transparent cover to indicate the principle involved and the simplicity of the mechanism.



Other instruments exhibited include the company's new Metavane, for telemetering and remotely controlling pneumatically; new valve positioner; new indicating float cage-type reset liquid level controller, and wide-strip potentiometer multiple point recorder.

Brown Instrument Co. (Division of Minneapolis-Honeywell Regulator Co.)

Philadelphia, Pa.

Booth 755, Coliseum

In attendance

E. B. EVLETH, vice president and general manager
L. MORTON MORLEY, vice president and general sales manager
R. L. MALLORY, Houston
E. B. KOHL, Houston
R. W. GREENDYCKE, Houston
F. A. RODGERS, Dallas
R. P. WALKER, Tulsa
M. PETTY, Dallas
R. A. WEIKEL, Philadelphia

Exhibit will feature indicating, recording, and control instruments for the regulation of temperature, pressure, flow, and liquid level in refinery processes, including a working demonstration showing an indicating transmitter, equipped with the Brown Pneumatic Remote Transmission System by which temperature, pressure, flow, and liquid level measurements may be indicated, recorded, and controlled remotely. This system, it is said, is particularly applicable for use in hazardous atmospheres where the use of electricity is to be avoided. The Brown combined electric and air-operated flow and liquid level system for remote transmission will also be in operation with the Brown Pneumatic Remote Transmission System.

Other instruments mounted on the centralized control panel board in operation, include:

Brown Multiple Recording Potentiometer Pyrometer: This instrument it is stated, will record from two to six temperatures from as many different thermocouples. The company refers to three outstanding exclusive features: 1. The chart drum is made of steel with a vulcanized rubber cover, similar to that used on a typewriter. 2. It is the only printing recorder using specially hardened steel print wheel with machine cut numerals. 3. The + sign is used for recording temperatures. It has special significance, namely, the horizontal line is the time coordinate and the vertical line of the plus sign identifies the temperature. Also exhibited will be the Brown Air-o-Line Controller for coordinating temperatures, pressures, flow and liquid levels, and Brown Flow Meters, in both electrical and mechanical types.

Brown Oil Tools, Inc.

Houston, Tex.

Booth 1109, Annex

In attendance

R. E. (HAP) MORWOOD
D. R. ETZEL
E. L. BASS
R. C. BENNETT
R. C. BUCHANAN
F. E. CONWAY
F. L. SCOTT, JR.
J. W. HINDMAN
A. S. BAYLOR
ALF. MATLOCK

New equipment to be exhibited will consist of Bradenheads, Whipstocks, and Liner Packers.

Builders Iron Foundry and %Proportioneers, Inc.%

Providence, R. I.

Booths 1142, 1144, Annex.

In attendance

R. P. LOWE, vice president and chief engineer of %Proportioneers, Inc.%, and industrial sales manager of Builders Iron Foundry and %Proportioneers, Inc.%
W. W. ADAMS, assistant industrial sales manager of Builders Iron Foundry and %Proportioneers, Inc.%
R. W. BIER, Houston representative
GARRETT PHILLIPS, Houston representative

Displaying a new model of the Flo-Watch register-indicator-recorder. This is a mercury-operated differential type of flow meter. New design of indicator and case have been incorporated. This Flo-Watch meter will be used to control the injection of chemicals by means of a plunger type chemical feed pump, the feature being that the Adjust-O-Feeder, or chemical feed pump injects in proportion to the rate of flow through the orifice plate or venturi tube, which actuates the mercury wells of the Flo-Watch. The connection between the meter and pump is made by a simple two-wire electrical circuit.

Also showing a boiler feed water control panel, illustrating the "shot" feeding of boiler treating compound. The differential type of transmitter, operated from a venturi meter tube will actuate the Adjust-O-Feeder chemical feed pump as well as remotely located register-indicator-recorder. The Adjust-O-Feeder will operate from an accumulated time interval.

Bull-Stewart Equipment Co.

Dallas, Tex.

Space 1012-C, outside

The Buda Co.

Harvey, Ill.

(In conjunction with its Texas oil field distributor, the Buda Engine & Equipment Co., Houston, Tex.)

Booths 732, 734, 736, Coliseum

In attendance

J. S. DEMPESY, president
R. K. MANGAN, vice president in charge of sales
E. D. CONANT, vice president in charge of manufacturing
J. C. BASEHEART, sales engineer
R. H. HEBERLING, sales engineer

Representatives of its Oklahoma and Kansas distributor, Buda Engine Service of Tulsa, will also be in attendance.

One important feature of the exhibit will be the company's Model 6-DH-1879 Diesel engine, with the parts and accessories necessary to convert the engine to a natural gas burning unit. This particular engine has a bore of 6¾ inches, stroke of 8¾ inches and a displacement of 1,879 cubic inches. One of its chief advantages is that it may be used for wildcat operation as a Diesel engine and then transferred into a proven field and operated, with changes, as a natural gas burning unit. Another engine that will be exhibited is the company's Model FR pumping engine.

All-purpose oil field jack

In addition the company will have a rather elaborate exhibit of hydraulic and mechanical jacks for use in the oil field.

E. D. Bullard Company

San Francisco, Calif.

Booth 748, Coliseum

In attendance

TED FELDS, manager, Houston
ED BAIN

Displaying new safety equipment of particular interest to the petroleum industry. The company's improved cylindrical first aid kit is now manufactured with a wall clamp that provides greater strength and durability, occupies less space and improves the appearance of this well-known aluminum container. Its canister gas mask for organic vapors recently approved by U. S. Bureau of Mines incorporates the company's one-piece moulded face piece, anatomically shaped to fit without excess tension, and its patented exhalation valve that provides less breathing resistance and permits the gas mask wearer to converse freely.

Of interest in operations involving spark hazards from tools, the company this year presents its line of Kopper Klad wrenches, built with hand forged steel completely coated with non-sparking copper, combining the strength and utility of the steel with the safety of copper.

Byron Jackson Co.
Los Angeles, Calif.

Booths 551-553, Coliseum

In attendance

ED UPTON — FRANK CHAMPION
JOE PROGRESS — C. F. VINCENT
JACK MILLER — R. T. TODD
MYRON HITE — MARSHALL MOORE
WENDELL CARLSON — E. W. STUART

As the company has just recently built a new office at Houston it is not exhibiting any equipment at the show. It is planned to have a presentable booth with sufficient room to accommodate customers and attempt to take as many as possible to the plant for inspection and to view the display of equipment.

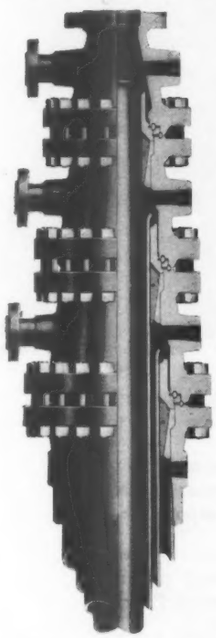
Cameron Iron Works, Inc.
Houston, Tex.

Booths 604, 606, 705, 707, Coliseum

In attendance

FRANK QUAIDY — J. M. (RED) TEAGUE
ROY N. BEAN — W. B. STEVENS
SAM PATTILLO — F. H. ISAACKS
W. HOLMES SMITH — O. V. PARKER
THAD L. PUTNAM — GENE TEER
PAUL T. PUTNAM

In addition to its full line of blowout preventer equipment, both pressure and manually operated, the company will exhibit a number of new and improved tools, including: several types of control heads, casing heads, tubing heads, mud valve, needle valve, expansion tube choke, casing-to-tubing packer, bottom-hole choke, and safety christmas trees.



One outstanding piece of equipment on display will be the Type "C" casing head, which features the "Flex-Steel" multi-ring gasket assembly. This feature eliminates resilient packing, yet provides a pressure-tight seal between the flanges, a pressure-tight seal of the annular space, a rigid hold-down of the casing hanger and string, a sealing means controlled from outside the casing head by flange studs independent of the weight of the casing string. This casing head was designed to eliminate all casing-size threads above the surface pipe thread. Five types of casing hangers are available for use with Type "C" casing heads. Made in 6,000-pound test, 3,000-pound working pressure models.

Calmec Manufacturing Co.
Los Angeles, Calif.

Booth 1536, Annex

In attendance

A. S. McINTYRE, vice president and general manager
JOSEPH E. YOUNG

Displaying an assortment of oil-well specialties that will include its line of valves, cement heads, chain tighteners, hardened steel pump liners for slush pumps, wire line spoolers, tubing spiders and one-man drill pipe spiders.

Of special interest to engineers and superintendents will be the display of the company's valves, according to A. S. McIntyre, vice president and general manager. This valve, it is claimed, is a metallurgical triumph in valve construction; stream-lined to do anything any ball and seat valve can do and do it more efficiently without springs or other mechanical aid. It will perform with the utmost efficiency in every service for which reciprocating pumps are adapted—no pump port is too large or too small. It is handling hot asphalt, hot and cold crude oil, hot and cold water, concrete, propane, cold lard, fruit juices, molasses, slush, paints and milk. After years of usage in a wide range of service, the manufacturers announce that no fluid is too heavy; no pressure too excessive; no speed too great; and no temperature too high to offset dependable performance of its valves.

Carbisulphoil Company
Dallas, Tex.

Booth 1582, Annex

In attendance

R. H. PRINGLE — DON L. STERLING

Description of exhibit: "Foille is a medical step forward in burn and wound treatment. It provides a simple method of treatment, yet one in marked contrast to present so-called dry treatments which have been used with severe burns for the past 10 years. Foille has been clinically tested through comprehensive, comparative animal studies and many human case records. Its principal advantages are evidenced in a materially reduced period of convalescence, remarkable control of shock and pain, together with a characteristic lack of infection. It is also especially successful in clearing up old and infected burns and wounds. It is being adopted by many large industrial institutions in their first-aid stations and first-aid kits.

"The exhibit will consist principally of enlarged photographic histories of burned cases. This pictorial display will clearly convey the marked lack of scarring and skin grafting which is typical of cases treated with Foille."

Carlyle Rubber Co., Inc.
New York, N. Y.

Booth 1117, Annex

In attendance

P. M. KAMINSKY, president
A. J. KAMINSKY, sales manager

Exhibiting formation tester cone packers, mechani-

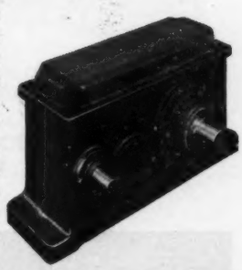
(Continued on Page 156)

IXL PUMPING REDUCERS

IXL Helical Speed Reducers have proven themselves in action! That's why you'll find them on hundreds of the toughest pumping jobs throughout the oil fields — working steadily where only the finest gearing and shafts mounted in rugged housings can give the service that's demanded. Designed specifically for the oil fields, IXL reducers are built by a company with eighty years' experience in the design and production of gears. There is an IXL Helical Speed Reducer for *your* pumping job — write for Bulletin 404 today! It's full of valuable engineering data — and complete details on IXL Helical Speed Reducers.

NEW! IXL REDUCER for Shallow Well Pumping

A new double-reduction helical oil well pumping reducer designed specifically for individual wells in shallow fields — that's the latest IXL contribution to the needs of the oil fields. The new unit is built in three sizes and conforms to the high quality of design and construction for which all IXL products are noted. Complete information upon request.



Direct Factory Representatives

MAX E. LANDRY
533 Mayo Bldg., Tulsa, Okla.

•

T. C. GRAHAM
Box 596, Overton, Texas

FOOTE BROS.
GEAR & MACHINE CORPORATION
5306 So. Western Blvd., Chicago

SHOULDERING for Leaders of the

Photo California Oil World

Left—139 Brown Instruments measure and control temperatures, pressures, flows and liquid levels in the new Refinery of The Richfield Oil Corp., Watson, Calif.

Right—Brown Instrument Centralized Control Board installed in the plant of one of America's largest oil refineries.

Leading refiners depend upon Brown Instruments to secure greater throughput, closer cuts, higher octanes and maximum yield at lower costs.

You can rely on the accuracy and be confident of the dependability of Brown Refinery Instruments in the operation of stabilizer reboilers, polymer units, tube banks, fractionating towers, case heads, gas accumulators, separators, stabilizer reflux, yield separators, topping units, etc.

Wherever they are installed — efficiency is increased because they afford closer measurement and more positive control of temperatures, pressures, flows and liquid levels.

Brown Indicating, Recording and Controlling Instruments — either electric or air-operated — can be mounted on individual panels or grouped on a central control board. Furnished in standard universal cases, adaptable for any style of panel mounting, they present a uniform and well-balanced appearance. Our engineers will be glad to recommend the instruments that will most economically meet your plant requirements.

Write for catalogs and information. THE BROWN INSTRUMENT COMPANY, *a division of Minneapolis-Honeywell Regulator Co.*, 4488 Wayne Avenue., Philadelphia, Pa. Offices in all principal cities. Toronto, Canada: 117 Peter Street — London, England: 70 St. Thomas' Street, S.E.1 — Stockholm, 16, Sweden: Nybrokajen 7 — Amsterdam-C, Holland: Wijdesteeg 4.

ELECTRIC AIR OPERATED
AUTOMATIC CONTROLS
BROWN
ELECTRIC + AIR OPERATED

BROWN

A DIVISION OF MINNEAPOLIS

For Temperatures . . . . .

RESPONSIBILITY

OIL INDUSTRY

POTENTIOMETER PYROMETERS

For indicating, recording and controlling temperatures in stills, towers, furnaces, flues, lines, etc. Catalog No. 1103.

FLOW METERS

For indicating, recording and controlling the flow of gasoline, gas, steam, water, air and other liquids, gases or vapors. Catalog No. 2006.

CO_2 METERS

For indicating, recording and controlling $\%CO_2$ in still and boiler furnace to check and insure proper firing efficiency. Catalog No. 3005.

AIR-OPERATED CONTROLLERS

For automatically controlling, within desired limits, temperatures, pressures, flows, tower levels . . . Electric and air-operated. Catalog No. 8902.

THERMOMETERS

For indicating, recording and controlling temperatures ranging up to 1200° F. Catalog No. 6704.

PRESSURE AND VACUUM GAUGES

For indicating, recording and controlling pressures and vacuums in stills, towers, steam and power plants, etc. Catalog No. 6704.

LIQUID LEVEL GAUGES

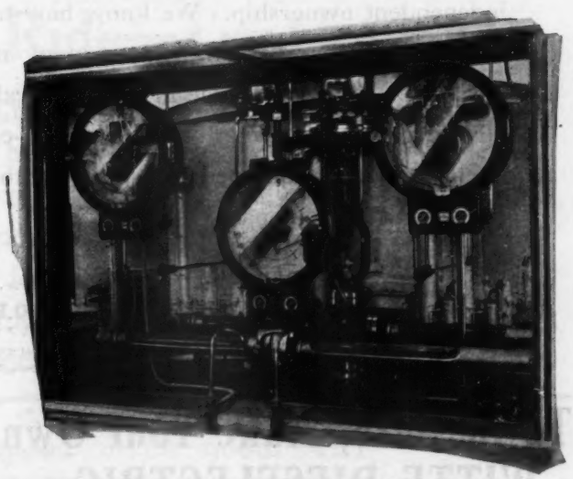
For indicating, recording and controlling the level of petroleum and petroleum liquid products in tanks, towers, etc. at a distance. Catalog No. 2006.

RESISTANCE THERMOMETERS

For indicating, recording and controlling low temperatures such as are encountered in dewaxing plants. Catalog No. 9003.

PNEUMATIC REMOTE TRANSMISSION SYSTEM

For remote transmission of measurement and control of temperatures, pressures, flows and liquid levels in hazardous atmospheres. Bulletin No. 94-3.



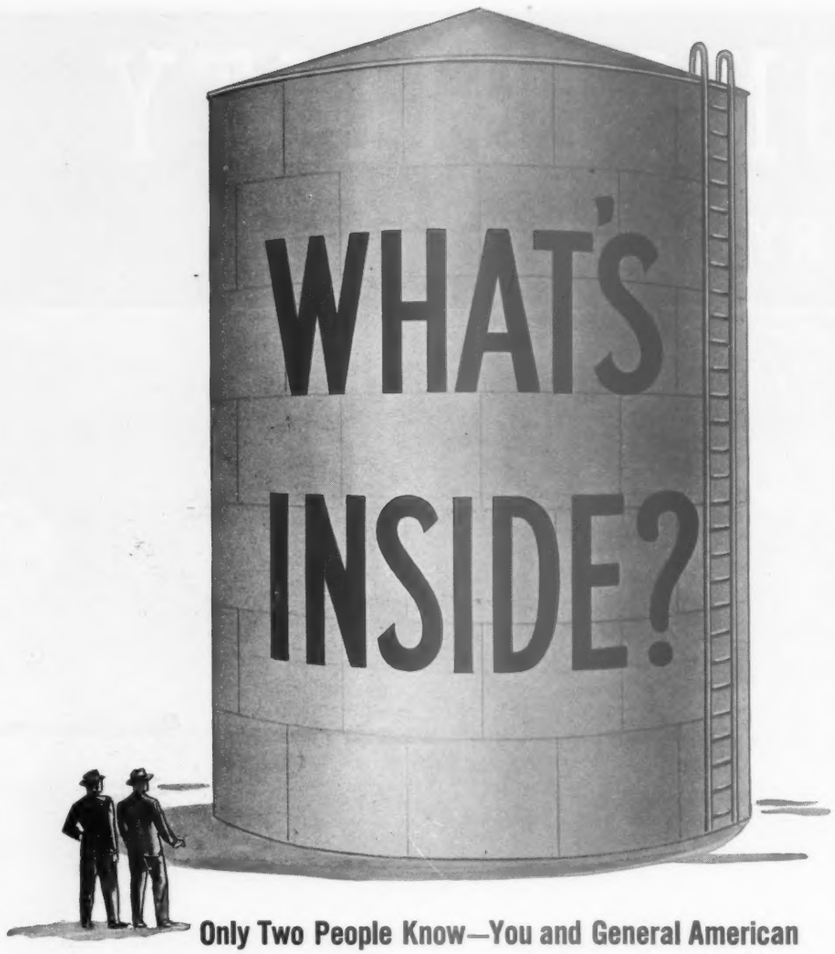
See the working demonstration of The Brown Pneumatic Remote Transmission System featured in our exhibit at

THE OIL-WORLD EXPOSITION
Booth No. 755

INSTRUMENTS

- HONEYWELL REGULATOR COMPANY

Pressures . . . . . Flows . . . . . Liquid Levels



Only Two People Know—You and General American

General American terminals give you the extra advantages of independent ownership. We know how to keep business confidences. Another reason why so many internationally known businesses have confidence in us. General American gives you all the privacy of your own terminal—completely safe—thoroughly modern, equipped for speed—without a penny's capital investment on your part.

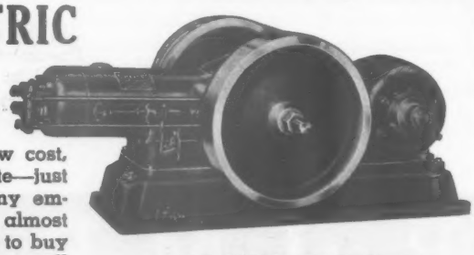
"Strategically located to serve you"

GENERAL AMERICAN TANK STORAGE TERMINALS

A DIVISION OF GENERAL AMERICAN TRANSPORTATION CORPORATION

Goodhope, La. (Port of New Orleans)
Westwego, La. (Port of New Orleans)
Carteret, N. J. (Port of New York)
Galena Park, Tex. (Port of Houston)
Corpus Christi, Texas

To Be Sure, Make Your Own Electricity With a WITTE DIESELECTRIC



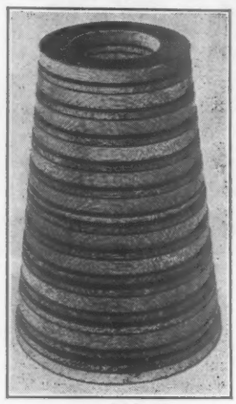
You don't need to think of high lines with a WITTE on the job. It is the direct line to low cost electricity wherever and whenever you want it. Fire hazards are reduced by use of low cost, non-explosive fuel. It is simple to operate—just feed her fuel and lubricant—almost any employee can do it, and then it can be almost forgotten. Get the facts on why it pays to buy a WITTE, built by the pioneer in the small Diesel field. *See Your Supply Dealer.*

4000 AND 8000 WATTS
Horizontal Dieselectric Plants
Prices $895 and up, f.o.b. Kansas City, Mo.

WITTE ENGINE WORKS
1984 Oakland Ave., Kansas City, Mo.

MAKERS OF RELIABLE PRODUCTS SINCE 1870

cal, industrial and oil field rubber specialties. The company states its cone-shaped rat-hole formation tester packer elements are made in all sizes and tapers for replacements on all makes and types of rat-hole formation testers. Regardless of the make of tester used; to obtain successful formation tests, the cone-shaped packer must be properly seated at the rat-hole. These cone-shaped packers are manufactured with precision tools to insure accurate tapers for positive rat-hole seating, accurate O.D. sizes are maintained to enable drilling fluid displacement as the tester is being lowered through the main hole to the rat-hole. Cone-shaped packer elements are constructed of properly vulcanized rubber and fabric discs (similar to rubber belting) and are finished to a smooth cone shape. A straight center hole (to size required to fit overtester mandrel) is maintained from the top to the bottom of the packer element.



Style 3

Caterpillar Tractor Co.
Peoria, Ill.

Spaces 1003-4-5-6, Walker Ave.

In attendance

W. K. COX, assistant manager, sales development division.

ROBERT CULSHAW, sales development division, in charge of exhibit.

C. M. BURDETTE, sales manager, central division.

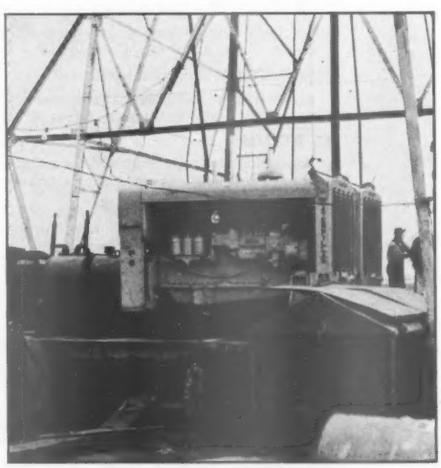
H. H. HOWARD, engine sales manager.

G. P. FENN, assistant engine sales manager.

J. N. BARNES, district representative.

A. L. ROBERTSON, district representative.

S. C. LITTLEPAGE, H. G. HARTZELL, JACK GILL, R. E. LORD, all engine sales division.



The exhibit will consist of the company's products, teamed with allied equipment manufactured by R. G. Letourneau, Inc., LaPlant-Choate Manufacturing Co., Trackson Co., Killefer Manufacturing Co., Athey Truss Wheel Co., Willamette-Hyster Co. These companies build bulldozers, trailbuilders, wagons, trailers, winches, etc., especially for "Caterpillar" track-type tractors.

The "Caterpillar" exhibit will feature its Diesel tractors, completely equipped for oil field service. Along with them will be the various types of road machinery, built by the company in Peoria. "Caterpillar" Diesel engines will be accorded much of the space. Nine sizes, ranging from 32 to 160 maximum horsepower will be equipped for duty in the oil fields. Most of these displays will be in action.

In addition, the company's Diesel engines will be featured in the exhibits of many other manufacturers, who use "Caterpillar" Diesels to power their products.

Mr. S. P. Gilley (Pilot) and Mr. Geo. H. Echols of Houston, Texas. This Howard 4-5 place Transport is powered with a 450 H.P. Wasp Jr. engine

For a *Smoother* and *Faster* Ride—Try Howard

High wings, which let you see DOWNWARD where the INTEREST lies, combined with a low center of weight, which gives that pendulum effect, lets the HOWARD "arrow" through tough going. This lessens fatigue without the necessity of throttling back and losing speed when it is ROUGH, therefore the HOWARD is faster in all-weather flying, yet bows to none in its power class in quiet air.

USABLE speed is of prime importance, but the new HOWARD for 1939 carries USEFUL loads up to 1700 pounds without "up-ing" gross loads, therefore takeoff performance is better with less overloading when you fill the seats. This increases RANGE and speed made good. TRY THIS SMOOTHER AND FASTER RIDE IN A 1939 HOWARD.

ASK FOR CATALOG

Howard Aircraft Corporation

5300 West 65th Street, CHICAGO, ILL., U. S. A.

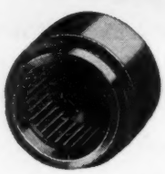
SEE THE HOWARD AT THE HOUSTON OIL EXHIBITION

AIR ACTIVITIES, INC., DISTRIBUTORS, HUGHES AIRPORT, HOUSTON, TEXAS

SULLIVAN SELECTS Spicer

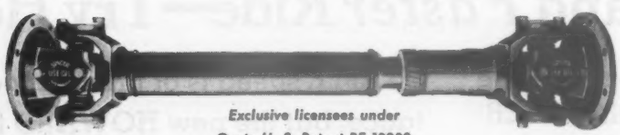
● To assure economical, dependable power transmission for their new No. 37 Seismograph Drill, The Sullivan Machinery Company standardized on **Spicer** universal joint between engine and rig.

The complete **Spicer** line of helical transmissions, clutches, single and 2-speed power take-offs, top-mounted power take-offs, universal joints and auxiliary transmissions meets every demand for performance and quality in petroleum production and servicing equipment. That is why so many leading manufacturers of oil field machinery demand **Spicer**.



Needle bearing assembly

Experience specifies **Spicer**.



Exclusive licensees under Goetz U. S. Patent RE 18080

Spicer Manufacturing Corporation · Toledo, Ohio

BROWN-LIPE	SALISBURY	SPICER	PARISH
CLUTCHES and TRANSMISSIONS	FRONT and REAR AXLES	UNIVERSAL JOINTS	FRAMES READING, PA.

ENARDO TANK EQUIPMENT

"In-Line" Vent Valve

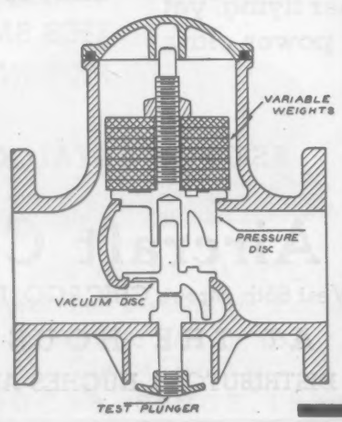
. . . controls vacuum pressure of individual tanks or battery. Flanges into the gas vent line. Can be conveniently located near walkway. Easy inspection and cleaning provided by hinged cover plate held by thumbscrew. Seating action simply checked by test plunger on atmospheric side at bottom of valve. Pressure variable from 1½ to 16 oz. For detailed information, write for descriptive circular.

"Enardo Equipment will conserve enough of the rich vapors to pay for themselves in a short time."

ENARDO FDY. & MFG. CO.

2729 SAND SPRINGS ROAD TULSA, OKLA.

"There is an Enardo Valve for every Tank Requirement".



Cavins Bailer Service of Texas
Houston, Tex.

Spaces 600, 601, Coliseum

Chain Belt Co.
Milwaukee, Wis.

Booths 515 and 517, Coliseum

In attendance

BRINTON WELSER, vice president
RUSSELL G. DAVIS
J. WALTER SNAVELY
W. A. PITTS

Exhibit will cover: Rotary drilling chains—Rex Deepwell A.P.I. No. 3, 60,000 pounds ultimate strength; Rex Deepwell A.P.I. No. 4, 130,000 pounds ultimate strength; Rex Champion A.P.I. No. 3, 75,000 pounds ultimate strength; Rex Champion A.P.I. No. 4, 170,000 pounds ultimate strength; Rex Universal chain, 115,000 pounds ultimate strength. New drive chains for drilling and pumping equipment—3120 Rex roller chain, 32,500 pounds ultimate strength; 3140 Rex roller chain, 45,000 pounds ultimate strength; 3160 Rex roller chain, 55,000 pounds ultimate strength; D-3120 Rex roller chain, 65,000 pounds ultimate strength; D-3140 Rex roller chain, 90,000 pounds ultimate strength; D-3160 Rex roller chain, 110,000 pounds ultimate strength; E-3120 Rex roller chain, 97,000 pounds ultimate strength: E-3140 Rex roller chain, 135,000 pounds ultimate strength; E-3160 Rex roller chain, 165,000 pounds ultimate strength.

Chevrolet Motor Division, General Motors Sales Corporation
Houston, Tex.

Space 1014, outside

In attendance

J. L. DROBAC E. J. PENNINGTON
H. K. POFFENBERGER, truck manager.

Will display several conventional model trucks, also one or two COE trucks. These trucks will probably be equipped with special units applicable to the oil industry.

Harry E. Clark
Houston, Tex.

Climax Molybdenum Co.
New York, N. Y.

Booths 1129, 1131, Annex

In attendance

PAUL M. SNYDER R. L. WILSON
J. E. WILSON H. E. HOSTETTER
A. K. WEST

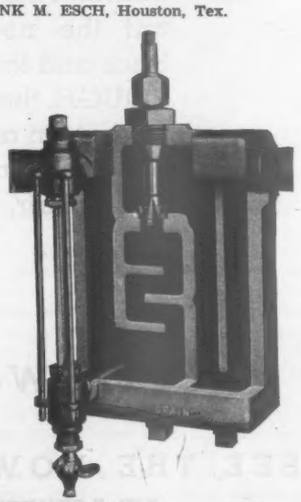
Exhibit will be a reception space, with a decorative background depicting applications of molybdenum in oil industry equipment.

Coe Manufacturing Co.
Painesville, Ohio

Booth 1323, Annex

In attendance

C. W. ST. CLAIR, Painesville, Ohio
FRANK M. ESCH, Houston, Tex.



Exhibiting Coe Drainator, the advanced steam trap with no moving parts, equipped with gauge glass and

Photo News valve values

THE EDWARD VALVE & MFG. CO., INC. • EAST CHICAGO, INDIANA

EDWARD VALVES KEEP PACE WITH THE NEWS!

FOR AMERICA'S NEW MERCHANT MARINE, FOR THE STREAMLINERS OF THE GREAT WEST, FOR SUPER-POWER CENTRAL STATIONS, HIGH EFFICIENCY INDUSTRIAL BOILER HOUSES OR ULTRA-PRODUCTIVE REFINERY PROCESSES, EDWARD CAST OR FORGED STEEL VALVES KEEP IN STEP WITH THE TIMES. SOUND IN FUNCTIONAL DESIGN, THEY ARE EASILY ADAPTED TO HARD JOBS.

One thing all Edward valves have — basic fitness for tough service. Edward experience in high pressure and high temperature installations, accumulated through the years, provides a reliable background for steady, continuous progress. It is Edward engineering policy to go places — but without undue risk.

SEALED BONNET COMING? Welded joints in pipe lines have contributed to the peace of mind of boiler house operating men. Welding applications have gone much farther than boiler lines. They also are used extensively in refinery service, in cross country pipe lines and even on oil well casings. Naturally, therefore, operators ask why valves still need bolted bonnets. Answer is that foreign matter gets into pipe lines and too often causes troubles which necessitate the disassembly of the valves. Picture shows an Edward 1500 lb globe stop valve with Stellited seat and disk. The seat is welded in place in the body. Question is how to keep tramp metal out of lines.

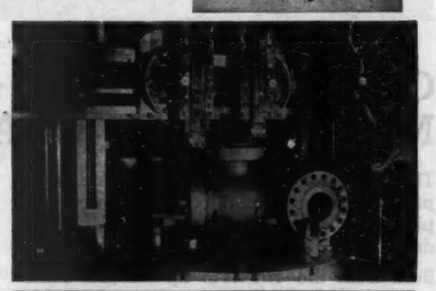
5,000 hp. LOCOMOTIVE. New steam-electric unit, developed by General Electric and Union Pacific, for speeds to 125 mph, uses Edward valves. Boiler pressure 1500 lb at 920 F.

PEACE TIME HIGH. With first year contracts let for 51 ships, U. S. Maritime Commission activities have mounted to an all-time peace record. Edward valves are to be used on a majority of all vessels under construction, both motor and steam ships. Cut shows Edward marine valves—gear operated stop check, angle stop, cast and forged steel.

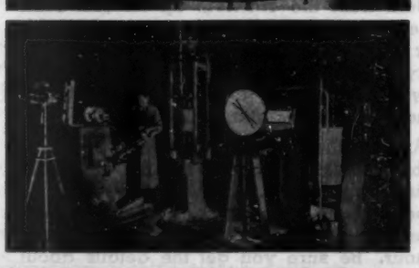
TANKERS USE EDWARD VALVES. Sensational progress in past few years in building high efficiency oil tankers has brought important additions to American shipping. This motorship uses a waste heat boiler.

FORGED BLOW-OFFS. For all boiler pressures over 320 lb — for land service — Edward offers forged steel blow-off valves. Marine ratings are lower. For long continued operation at high pressures, without emergency shutdown, the disk type of blow-off valve has been found indispensable. Cross sectional view shows one of a number of optional arrangements of Edward blow-off valves in tandem. Seat and disk EValloy or Stellited.

BIG VALVE FOR TEXAS. Boring mill shown at right has 102 in. swing, but elbow inlet body casting, which is being machined, barely cleared the frame. This is a 12 in. 1500 lb sp non-return valve. Body and bonnet of nickel-chromium-molybdenum alloy cast steel.



SWISS TENSILE MACHINE. Getting the correct answer is the task of this formidable piece of Edward laboratory equipment, built to order in Amsler works at Schaffhouse. Results depend on extreme accuracy of temperature control, measurements of strain, and expert technique.



EDWARD VALVES

Stop · Check · Blow off · Non-return · Feed Line · Relief · Bleeder Line · etc.

THE SOLUTION of YOUR DITCHING PROBLEMS - -

CLEVELANDS

Dig "Anywhere--Anytime"

Jobs like this show "Clevelands" stability in hilly territory.

Put "Clevelands" on the line! You'll be the gainer. Whether it's a long main-line job, gathering lines or loops — "hot-spot" reconditioning or merely short scattered routine work such as field lines or ordinary maintenance you'll find "Clevelands" dependability, mobility and all 'round utility shows definite savings in time and expense.

"Clevelands" accomplish this because practically every operation incidental to mechanical ditching has been speeded up . . . waste motion eliminated . . . precious minutes saved.

Here is soundly engineered equipment, ultra-modern in design, that is backed by a quality construction that is without equal.

Complete the Job with "CLEVELAND" Model 90 PIPE-CRANE and BACKFILLER

This new up-to-the-minute machine lays pipe, backfills ditch, loads and unloads pipe and "snakes in" loads by winch or draw-bar.

Built from the crawlers up for just such service, it has already proven in the field, a machine of great utility and high capacity. Rapid, easy, field-conversion from one type of usage to another is designed-in, not secured by attachments.

Among the many exclusive features of the Cleveland Model 90 is one-man continuous operation in either direction at backfilling speeds up to 52 feet per minute and at travel speeds up to 5½ miles per hour. Be sure you get the details about this machine.

All "Clevelands" are easily transported at truck speed on special trailers. Load or unload in 10 to 15 minutes.

THE CLEVELAND TRENCHER COMPANY

"Pioneers of the Small Trencher"

20100 ST. CLAIR AVE. CLEVELAND, OHIO.

adjustable orifice which requires only one adjustment with any installation; will, it is stated, eliminate all condensate and air without any steam loss; requires no by-pass and is not subject to periodic failure. It is suitable for pressures up to 250 pounds in cast iron and 450 pounds in steel without any change of orifice.

Combs-Foretich Oil & Water Separator Co.
Conroe, Tex.

Space 1038-B, outside

Continental Motors Sales & Service Co.,
Dallas, Tex.

Subsidiary of Continental Motors Corp., Detroit, and Muskegon, Mich.

Booth 1017-A, outside, Bagley Avenue

In attendance

B. F. TOBIN, JR., vice president in charge of sales
FRED T. GOULD, manager Continental Motors Sales & Service Co.
JOSEPH GAIA, sales representative

Exhibit will contain principally gasoline and natural gas burning engines. A few of these engines will be in operating condition, one of which will drive a generator to furnish electricity for a large neon sign bearing the company name. Also power units driving pumps for display purposes. The Guiberson Co. will have on display a pump driven by a Continental power unit. It is expected to have a total of 12 various types of engines, power units and generating plants on display. This will include the Tiny Tim portable generating unit for light service.

The Continental Supply Co.
Dallas, Tex.

Spaces 328, 330, 332, 334, 336, 338, 340, 429, 431, 433, 435, 437, 439, 441, Coliseum

In attendance

W. J. MORRIS, president
F. M. MAYER, vice president and treasurer
F. I. BRINEGAR, vice president
W. G. FITZPATRICK, manager of sales
N. A. ENDICOTT, assistant manager of sales
A. J. OLSON, chief engineer
J. C. SLONNEGER, assistant chief engineer
J. A. MUSSLER, manager tubular sales
C. W. KING, manager pipe department
H. E. SPENCER, director of purchases
F. H. THRAILKILL, district manager, Houston
E. N. WOOD, district manager, Shreveport
C. N. SWANSON, district manager, Tulsa
R. A. BREWER, district manager, Fort Worth
R. L. COLLIER, assistant district manager, Corpus Christi
J. H. BERRY, assistant district manager, Wichita Falls
WILLIAM D. CRAIG, assistant district manager, Longview
F. J. LAFITTE, district machinery sales representative
R. E. F. SCHMID, manager of exposition

Occupying a chain of booths between Aisles 3 and 4, the company with affiliated manufacturers will exhibit a wide variety of drilling and production equipment. Features of especial interest in the exhibit will be the auxiliary steam engine drive display in collaboration with the Emsco Derrick & Equipment Co. and Gardner-Denver Co. Continental's parent organization, Youngstown Sheet & Tube Co., will feature a working replica of the new seamless tube mill at Youngstown, Ohio. Detailed descriptions of these displays and the other equipment exhibited by Continental's associated companies is listed below under the name of each manufacturer.

Broderick & Bascom Rope Co.
St. Louis, Mo.

In attendance

D. LARKIN, general manager
FRED ZIMMERMAN, sales manager
M. R. GAYLE, Mid-Continent sales manager
GEORGE T. BORN, assistant sales manager
D. E. DICKEY, research engineer
R. A. HILL, Houston manager

A miniature wire rope machine explaining the complicated procedure of wire rope manufacture will be exhibited. Samples of practically all Broderick & Bascom oil industry wire rope will be shown, including

drag lines, sand lines, rod lines, and winch lines. Factory methods will be explained.

Clayton Mark & Co.
Chicago, Ill.
In attendance
ORA COX, sales manager
T. BRUCE COX, field representative

A new handlebar check union will be of much interest to operating men. Exhibited in actual operation at a number of different positions, it will be shown that the satisfactory operation is not affected by position. Cut-away views will show how positive sealing and full flow is accomplished. The forerunner of this union, the well-known handlebar union, will also be exhibited in various steps of manufacture.

Climax Engineering Co.
Clinton, Iowa
In attendance
E. F. DEACON, president
T. L. KEELING, Mid-Continent sales manager

Visitors interested in production will take unusual interest in the Climax H-4-B Blue Streak engine designed expressly for oil well pumping service. Equipped with extra heavy flywheels, the engine provides a remarkably smooth pumping cycle. Box base construction provides a large oil sump as well as structural stability. An oil-field type governor, numerous safety devices, and a running type oil gauge are other features of interest.

D + B Pump & Supply Co.
Los Angeles, Calif.
In attendance
E. E. STEVENSON, general manager
R. H. SOLL, metallurgist
L. C. SCOTT, Mid-Continent manager of sales

A moving exhibit showing numerous D + B pumps with cut-away parts will be featured. This company makes a specialty of producing pumping equipment to meet situations that are difficult to overcome. Various types of its pumps to overcome unusual problems will be exhibited and explained. In addition, a general line of pumping equipment, including both surface and subsurface accessories, will be shown. Attention is directed to the alloy steel used in manufacturing this equipment. A.P.I. standards are rigidly adhered to so that parts will be completely interchangeable. Production men from every field will find some part of the company's exhibit that will interest them.

Emsco Derrick & Equipment Co.
Los Angeles, Calif.
In attendance
G. W. WALTON, vice president and Mid-Continent machinery manager
S. W. WEBSTER, Mid-Continent sales and service manager
L. W. STAHL, chief engineer, Houston plant

The company's auxiliary steam engine drive will be exhibited in connection with a Gardner-Denver 9½ by 8 vertical steam engine; the drive will be shown in operation, the engine being actuated by a small electric motor. The unit normally consists of a 14 by 14 Gardner-Denver horizontal steam engine, and is ordinarily used for drawworks engine, but in addition the Gardner-Denver 9½ by 8 vertical steam engine is provided as auxiliary prime mover. It is used principally to drive the rotary table. However, by means of the Emsco auxiliary drive, extremely flexible operation may be obtained. It is possible to "drill up" while the rotary machine is in operation. Either engine may operate the drawworks or rotary machine in emergencies, a safety feature much appreciated in deep drilling operation.

In connection with the auxiliary drive will be exhibited the newly designed Emsco KS-27-½ rotary machine. Fully enclosed and of fabriform construction, the table features flood lubrication, and spiral bevel gears. The main bearing is preloaded, preventing hammering of the races when the table is run under light loads. A patented design is included which allows the drill stem bushings to be driven by the table, eliminating the inefficiency and costly practice of driving the drill stem bushing through the master bushing.

Fairbanks, Morse & Co.
Beloit, Wis.
In attendance
H. J. RENKEN, manager, oil field division
F. D. RATCLIFFE, representative

THREADS—
DEEP—SHALLOW—STANDARD

—are easily produced with "TOLEDO" Adjustable Pipe and Bolt Die Heads.

Simple, positive adjustment of 4 to 5 turns on pipe and 1/64" on bolts. Loosen 4 cover screws and turn knurled ring until desired size is reached.

Dies can be reground or replaced at small cost. All segments cut equal even when standard setting is changed.

For repair work and where threads must be hidden, these "TOLEDO" heads are of real value.

Any combination furnished. Ratchet handle or two handle stock if desired. Your dealer can supply you or write us for further details.

THE TOLEDO PIPE THREADING MACHINE CO.
TOLEDO, OHIO NEW YORK OFFICE AND DISPLAY, 72 LAFAYETTE ST.
"TOLEDO"

Valves *for pipe lines*

KENNEDY pipe line valves have thoroughly proven their sturdiness, ease of operation and lasting reliability in installations all over the country. They are generously proportioned in every detail with massive bodies and flanges that resist distortion from pipe line strains and with strong, efficient operating mechanisms that assure tight closure and quick release.

Other Kennedy Valve types for the oil industry include 400-lb., 700-lb., 1000-lb., 1600-lb. and 2500-lb. test gate valves, together with valves for general service; and complete lines of malleable iron screwed fittings and cast iron flanged fittings.

Write for the Kennedy catalog which fully describes and lists all the Kennedy products.

The Kennedy Valve Mfg. Co.
Elmira, N. Y.

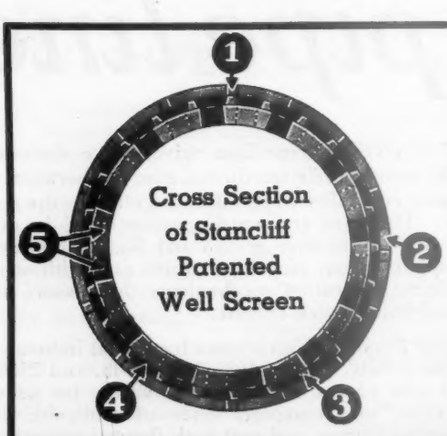
KENNEDY
VALVES-PIPE FITTINGS-FIRE HYDRANTS

MILLIONS OF BARRELS of OIL

Free from sand

are being produced each year through

STANCLIFF WELL SCREEN



ADVANTAGES IN DESIGN AND CONSTRUCTION . . .

1. Full depth, full width spacing lugs rolled into the square wrapping wire make the gauge and maintain it.

The lugs space the wire at the top and at the bottom of the wire. The square wire helps to resist a change in gauge from abrasion and corrosion.

2. Wire wrapping. Galvanized Steel, Brass, Bronze, Admiralty, and Stainless Steel Wire, can be furnished.

3. Ribs are laid on the outside of the pipe, and are of the same metal as the wrapping wire.

4. Flow channels are formed by the ribs to increase screening efficiency and reduce fluid velocity with the consequent minimizing of sand cutting. This construction makes the STANCLIFF SCREEN easy to clean.

5. Perforations in the pipe are staggered with one row of holes under each flow channel.

See display at the OIL-WORLD EXPOSITION, April 24-29

HOWARD SMITH COMPANY

1201 SAWYER STREET **HOUSTON, TEXAS, U. S. A.** **P. O. BOX 688**

EXPORT REPRESENTATIVE: ACME WELL SUPPLY CO., 136 LIBERTY ST., NEW YORK, N. Y.

H. D. GOBBLE, representative
F. P. GRUTZNER, assistant chief engineer

The F-M 15 HP Type "Z" engine will be exhibited in its new role as an oil well pumping engine. Now adapted for pumping service, it has extra-heavy flywheels, force feed lubrication, and is totally enclosed. A radiator is optional equipment, and provides ample cooling for 24-hour operation. Other features are a V-belt driven circulating pump, exhaust silencer, and a Type "J" clutch.

Farrar & Trefts, Inc.
Buffalo, N. Y.
In attendance
JOHN C. TREFTS, president
S. MENSONIDES, vice president

Photographs of Farrar & Trefts oil country boilers will be exhibited, and features of interest will be explained. Farrar & Trefts will also have an exhibit in Space 1022, outside, where a new all-welded "High Power" oil country boiler will be on display. The all-welded boiler features lighter weight, easier washing and cleaning, elimination of riveted joints, and low maintenance cost. A stream-lined effect is obtained with the elimination of riveted joints.

The Falk Corp.
Milwaukee, Wis.
In attendance
W. P. SCHMITTER, chief engineer
W. L. SCHNEIDER, assistant sales manager
T. F. SCANNELL, district manager, oil field division

Occupying a prominent spot in the Continental exhibit will be a Falk 70CD gear unit, representing a complete line of double reduction gears for oil well pumping. In addition will be several speed reducers and motor reducers as applied in oil industry service. Herringbone gears as used in the 70CD oil well pumping unit were pioneered, it is stated, and cut on special machines designed and used exclusively by Falk. Double end high- and low-speed shafts afford the advantage of assembling the brake or pulley on either side of the high-speed shaft. The company's trough system of lubrication insures, it is stated, a clean supply of lubricant to all bearings, while special oil retainers prevent any leakage of oil and form an effective seal against the admission of dirt. Ratio of the 70CD unit is 30.4:1, and the peak torque capacity is 140,000 inch pounds.

Gardner-Denver Co.
Quincy, Ill.
In attendance
E. F. SCHAEFER, vice president
R. J. MacFARLAND, sales manager
R. J. BAUER, representative

In connection with the Emsco auxiliary drive, Gardner-Denver will exhibit the 9½ by 8 vertical steam engine. This engine, it is stated, gives remarkable steam economy for rotating by use of variable cutoff. It is described as capable of sustained high speeds, and suitable to handle the long strings of today's deep drilling service. In addition to use with the auxiliary drive, the vertical engine is recommended for driving power slush pumps or for independently serving as a prime mover for the rotary machine.

The Mechanical Rubber Co.
Passaic, N. J.
In attendance
B. F. RUETHER, president
W. E. BELCHER, district sales manager
A. M. LANGLEY, representative
B. F. FRANKLIN, representative

Belting, hose and packing especially manufactured for oil country use will be displayed. Super Rough Rider rotary hose, manufactured to resist abrasion with its multiple plies of strong cotton duck, flat braided steel wire and durable, live rubber will also be explained. Mechanical Rubber manufactures a specific type of packing, and a specific type of hose for every oil-industry use. Samples will be exhibited on a large display board, and features explained by representatives.

New Bedford Cordage Co.
New York, N. Y.
In attendance
GEORGE W. HAYWOOD, vice president.
H. W. DAVIS, sales manager

Since 1912, when Continental first entered the supply business, New Bedford Cordage Co. has distributed its products exclusively through Continental Supply Co. to the oil industry. New Bedford Cordage has been in the business of producing quality cordage for more than 100 years. Samples of the highest grade selected manila fiber, chosen from the hemp markets of the world, will be featured by this concern. Spinning lines, cat lines, drilling cables, and pull rods will be on display.

Westcott Valve Co.
East St. Louis, Ill.
In attendance
A. V. WADSWORTH, executive vice president
L. L. SCHARF, assistant treasurer
W. C. WADSWORTH, manager, Tulsa
H. H. TINCH, manager, Houston

Sectionalized models of Westcott valves reproduced in miniature will be a feature of the exhibit. A christmas tree made completely of aluminum and produced in the company's foundry and shops will also be on display. All work parts will be fully exposed by the cut-away section, and representatives will be on hand to explain the detailed mechanisms.

The Youngstown Sheet & Tube Co.
Youngstown, Ohio
In attendance
C. H. LONGFIELD, general manager sales
M. S. CURTIS, sales promotion manager
E. P. COREY, general manager tubular goods sales
J. C. SIEGLE, general superintendent tubular goods division
A. A. CHAMBERS, metallurgist
G. W. CHRISTOPHER, assistant manager tubular goods sales
HARVEY L. MILLER, special representative in charge oil country tubular sales
J. M. JACKSON, district sales manager, Houston
L. E. BATTIN, salesman, Houston
GEORGE V. JAMES, Youngstown
ED HENDRICKS, Youngstown

A working model of the company's new seamless

all Steel of Course!

With the introduction of the CHIKSAN All-Steel Rotary Hose, several years ago, drillers quickly recognized the increased safety, the greater strength and the longer life its *all-steel construction* provided . . . the flexibility assured by its Heavy Duty Swing Joints, turning full 360° on double rows of hardened steel balls in flame-hardened races. Today, more and more Drillers are standardizing on CHIKSAN All-Steel Rotary Hose not only because of its greater safety, strength and long life, but because these same factors make it a profitable investment that saves time and money.

CHIKSAN BALL BEARING SWING JOINTS

CHIKSAN OIL TOOL CO., LTD.
FULLERTON, CALIFORNIA

HEAVY DUTY REAMERS
STANDARD REAMERS
THREE-WAY DISC BIT
CIRCULATING HEADS
MUD GUNS
BALL BEARING SWING JOINTS for ALL PURPOSES

mill will show in detail the manufacture of seamless pipe. Beginning with piercing of the billet, the model shows the various steps up to the completion of the finished tube. The miniature mill will be operated by assistants who will explain factory methods.

Cooper-Bessemer Corp.
Mount Vernon, Ohio

Booth 1529

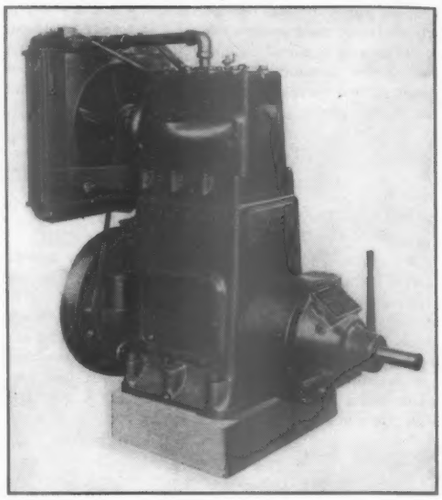
In attendance

A. A. BURRELL — R. H. DALE
B. L. POTTER — A. M. BUXTON
D. W. McKAY

The corporation will display its new addition to its line, the Type G-SC vertical pumping engine, of which the company says while it is designed primarily for oil-field pumping and drilling service, this engine is also fully adapted to auxiliary and light power needs; though light in weight, it furthers the tradition of ruggedness in Cooper-Bessemer products; built to heavy engine standards, yet moderately priced, Type G-SC is shipped as a completely assembled unit, with radiator and fan as standard equipment.

The G-SC engine is rated 25 to 35 horsepower at speeds of from 600 to 800 r.p.m. It is a two-cylinder, two-cycle unit with bore of 5½ inches and stroke of 7 inches. Its overall height is 4 feet 1¾ inches, overall width 2 feet 6 inches, and overall length with clutch 5 feet. The minimum amount of concrete required for its foundation is given as 1 cu. yd. Starting may be accomplished either by hand or compressed air. Meehanite metal is used for all cast parts of the engine.

The vertical design and low overall dimensions of the Type G-SC are said to reduce foundation and housing costs to a minimum and these features, together with its lightweight, make it an easily transported and installed unit. Among many features claimed by the maker are low first cost, low foundation and housing costs, extreme portability, long-life construction and design, magneto ignition, full pressure lubrication,



clutch or straight pulley drive, slow-speed reliability, tapered roller main bearings, and low maintenance costs.

Fred E. Cooper
Tulsa, Okla.

Main Entrance to Exhibit Building

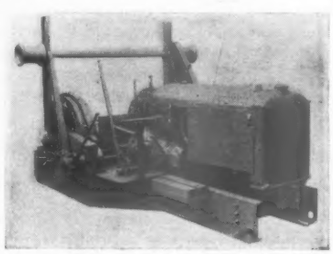
In attendance

FRED E. COOPER, Tulsa
A. G. BAILEY, Tulsa
J. W. ALLEN, Tulsa
OSCAR PAYNE, Tulsa
W. H. ALLEN, Tulsa
LOUIS GASCHE, Tulsa
C. F. NELSON, Longview, Tex.
W. E. GORANFLO, Longview, Tex.
JACK FINCHAM, Longview, Tex.
JOHN FLANAGAN, Longview, Tex.
DOWNS BLACKBURN, Lake Charles, La.
O. J. WORK, Beeville, Tex.
W. C. SIMPSON, Odessa, Tex.

Will show a representative line of Allis-Chalmers oil-well servicing and hoisting equipment and complete line of five oil-field power engines, comprised of Model L, 550 ft. lbs. torque, Model E, 375 ft. lbs. torque, Model U, 200 ft. lbs. torque, Model W, 128 ft. lbs. torque, and Model B, 74 ft. lbs. torque.

On exhibit will be three models of well-servicing equipment, being shown at the Houston show for the first time.

Allis-Chalmers Model UEL skid winch, single drum with overhead cathead and rotary drive. This unit has eight line speeds on the winch drum, ranging from 49 feet to 1,095 feet p.m. Maximum line pull is 54,032

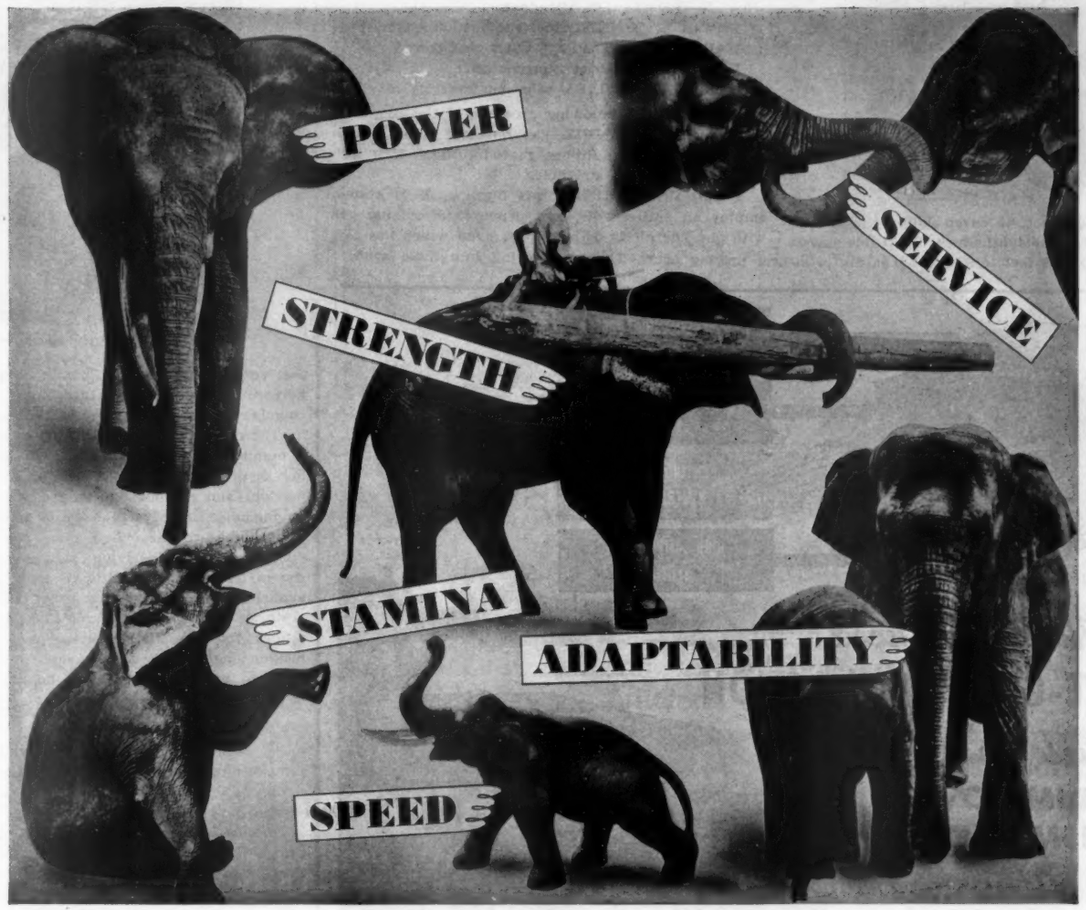


pounds. Drum capacity 6,720 feet of seven-eighths inch line. This unit can be furnished in two smaller drum sizes. Unit is powered with a slow speed tractor-type Allis-Chalmers engine. Four cylinders, bore 5¼ inches, stroke 6½ inches.

Allis-Chalmers Model L tractor, particularly adapted for drilling with rotary or cable tools and deep well cleaning out. Road speed 10 m.p.h. Transmission has four speeds forward, one reverse. Maximum line pull 62,000 pounds. Spools 39,300 feet of one-half inch and 13,600 feet of seven-eighths inch line. Eight line speeds on drum from 59 feet to 974 feet p.m. Six cylinder engine, 5¼-inch bore, 6½ inch stroke. Torque 550 ft. lbs., at 700 r.p.m. Also in skid type.

Allis-Chalmers Model L drilling unit. This skid type unit is designed for mounting on a long wheel base

There are more
GENUINE
WILLIAMS
SUPERIOR DROP-FORGED TOOLS
"VULCAN"
CHAIN PIPE TONGS
IN OIL FIELD USE THAN ALL
OTHER MAKES COMBINED
15
VULCAN
W
2 TO IZIN PIPE
J.H. WILLIAMS & CO.
DROP FORGED IN U.S.A.
9 SIZES WITH FLAT LINK,
OR CABLE CHAIN FOR
PIPE, 1/8 TO 18 INCHES.
Also "VULCAN SUPERTONGS"
The maximum in chain tong strength. Same design but drop-forged from alloy and high-tensile steel, heat-treated and equipped with ALLOY "Superchain". 50% greater strength than regular "Vulcan" Tongs of corresponding size and weight. 8 sizes, for 1/8 to 18" pipe.
W
WILLIAMS
SUPERIOR DROP-FORGED TOOLS
J. H. WILLIAMS & CO., 75 Spring Street, NEW YORK
Headquarters for: Drop-Forged Wrenches Carbon and Alloy, Detachable Socket Wrenches, "C" Clamps, Lathe Dogs, Tool Holders, Eye Bolts, Hoist Hooks, Thumb Nuts and Screws, Chain Pipe Tongs and Vises, Etc.
WESTERN WAREHOUSE & SALES OFFICE CHICAGO — WORKS BUFFALO, N. Y.



They "have what it takes" to do your work

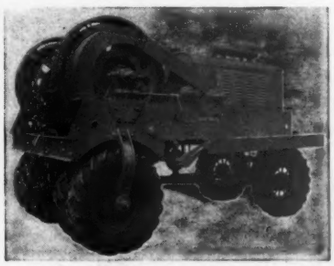
Americans have what it takes, and it *takes* plenty! Oil-field service, with its tremendous loads, strains and impacts, is the supreme test of bearing quality. When you realize that American Roller Bearings are in standard use by the *majority* of drilling-equipment manufacturers, and that *not one American* application has ever been abandoned, you see what we mean when we say that these heavy-duty bearings *dominate* in the oil industry.

If you *use* drilling equipment, specify American Heavy-Duty Roller Bearings. If you *make* drilling equipment, remember that your products will perform better with *Americans* in the heart of the assembly.

AMERICAN ROLLER BEARING COMPANY
Pittsburgh, Pa.
Pacific Coast Office, 321 W. Pico St., Los Angeles

AMERICAN *HEAVY DUTY* **ROLLER BEARINGS**

truck or trailer and can be used with rotary or cable tools. Equipped with two drums, cathead, rotary drive, and spudding equipment. Will drill wells to 6,000 feet. Maximum line pull 62,000 pounds. Line capacities:



Front drum 13,600 feet of seven-eighths inch, rear drum 7,320 feet of seven-eighths inch. Eight line speeds on each drum, from 59 feet to 974 feet p.m. Six cylinder engine, 5¼-inch bore, 6½-inch stroke, torque 550 ft. lbs. at 700 r.p.m. Can be mounted on long wheel base truck or trailer.

Coppus Engineering Corporation
Worcester, Mass.

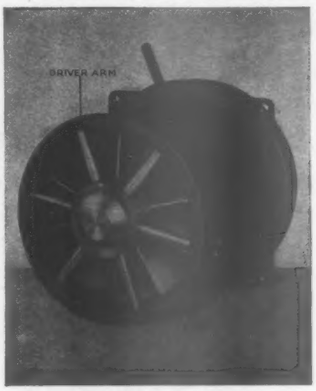
Spaces 1146, 1148, Annex

In attendance

EDWIN L. DENNIS, chief combustion engineer
MARTIN van STAPPEN, sales manager
R. W. BIER, district representative
GARRETT PHILLIPS, sales engineer

Exhibiting the following products of the company: Coppus Dennis FANMIX gas burners; Blue Ribbon steam turbine; Blue Ribbon geared turbine; heat killer; tank ventilator; air filters.

Coppus-Dennis Fanmix gas burners, it is stated, employ an entirely different principle of mixing gas with air. The air is delivered by a fan which has several driving arms. The gas flowing into these arms and leaving them through small orifices causes the fan to rotate at high speed. As the gas flow, from the rotating orifices, is practically at right angles to the air flow a very thorough mixture of gas and air is obtained. Practically no excess air is needed for perfect combustion. As the Fanmix burner discharges a perfect combustible mixture into the combustion chamber, no secondary combustion takes place.



13-inch Fanmix gas burner

The company's "Blue Ribbon" steam turbines have a number of refinements. The constant speed governor is of totally enclosed design, without lever connections and an independent excess speed safety trip, having a separate valve body is actuated directly by steam pressure through a pilot valve. A double reduction unit for driving slow-speed equipment is shown. The company states its tank ventilator is now available with an explosion proof, Underwriters' Laboratories approved motor for Class D hazardous conditions. Its Type FD air filters, used on internal combustion engines, air compressors, rotary blowers, etc., have an improved method of holding the filter cells in the filter housing which provide for easy removal.

Core Drilling Co.
Houston, Tex.

Space 1542, Annex

W. H. Curtin & Co., Inc.
Houston, Tex.

Booths Nos. 358-360, 459-461, Coliseum

In attendance

W. H. CURTIN, president
B. A. McENNIS, vice president
K. H. CLOUGH
M. A. SMITH
J. A. MULLER
B. B. MANUEL

Equipment on display: Automatic pH indicator and recorder; front view Ful-Kontrol petroleum distillation apparatus, grease channel tester for rear-axle lubricants; new smoke tendency lamp for determination on all grades of kerosene; industrial viscometer; indicating and recording pressure gauges; manometers; heavy duty hand centrifuges; electric centrifuges; safety and relief valves; Chainomatic analytical balances; analyzed chemicals; color slide projector; Pyrex glassware; Exax Blue Line glassware; porcelain laboratory ware; combustion testing equipment; indicating and recording potentiometers; and numerous improved oil testing equipment.

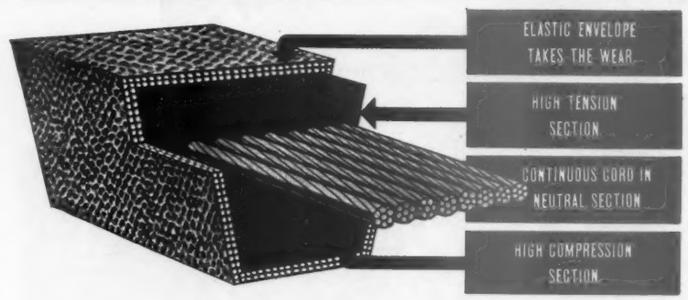
Crane Company
Chicago, Ill.

Booths 745, 747, 749, 751, Coliseum

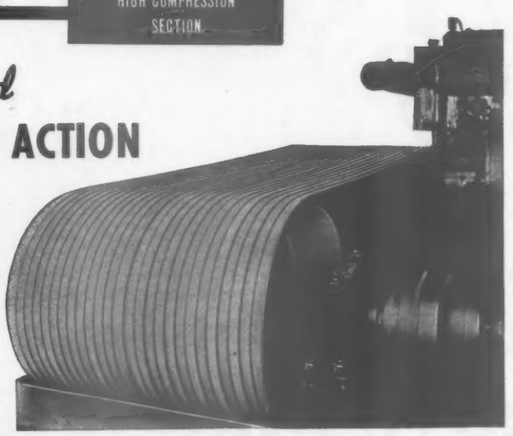
In attendance

P. R. MORK, vice president, in charge of sales
W. H. PAPE, manager of valve and fitting department
T. R. TAYLOR, district manager, St. Louis
R. A. HENDRICKSON, manager of oil sales section, valve and fitting department, Chicago
E. JOHNSON, manager, Crane Co., Houston, Tex.
E. V. PARKER, zone representative, Houson
B. E. FOSTER, zone representative, Dallas
T. M. LOWE, display and exhibit department, Chicago.

Complete line of valves and fittings for the oil industry and display showing types of welding done in the company's shops. Included will be a 4,000-pound



Their Balanced
"GROOVE-GRIPPING" ACTION
Gives You
MAXIMUM POWER TRANSMISSION
At
MINIMUM COST!



New MEDART V-BELTS
"They Grip the Grooves"

The New Medart V-Belts with their "groove-gripping" action are precision engineered and constructed—assuring maximum power transmission—*at minimum cost.*
The load-carrying cord section of the belt is concentrated at the neutral axis of the belt assuring minimum friction and safeguarding the tension-carrying element from internal breakdown.
Further—each strand in each individual belt, as well as each belt in a multiple drive, carries its proportionate share of the load. . . . This results in smooth, uniform action—permits maximum belt tension—eliminates undue wear or strain—prolongs belt life.
***Investigate Now* the money saving advantages you get with these new Medart V-Belts. "They Grip the Grooves."**
***Get in Touch With Your Medart Representative or Distributor.* They will assist you in the selection of a complete V-belt drive that will give you continuous, trouble-free service at the lowest cost.**

THE MEDART COMPANY
3524 DeKalb St. • • • St. Louis, Mo.

MEDART

cast carbon steel flange ring type joint globe valve with the body sectioned to show its construction and operation. There also will be a 4,000-pound cast carbon steel flange ring type joint ell and a 4,000-pound cast carbon steel flange ring type joint tee.

Crane Packing Company
Chicago, Ill.

Booth 1118, Annex

In attendance

ROY BLACKBIRD MARK BLACKBIRD
E. B. HEATHCOTT R. W. OVERTON
F. E. PAYNE K. V. ROHLEN

Material exhibited: Metallic packing, semimetallic packing, plastic metallic packing, in spiral, coil, ring, and set form; packings for centrifugal pumps and high-pressure hot oil pumps; packing hooks; "John Crane" Cranelite piston rings; swivel sets; polish rod sets.

Crutcher-Rolfs-Cummings
Houston, Tex.

Booth 1048 with W-K-M Co.

In attendance

E. L. ROLFS J. D. CUMMINGS
G. W. GOFF

Description of exhibit under W-K-M Co.

M. N. Dannenbaum Company
Houston, Tex.

Booths 518, 520, 619, 621, Coliseum

In attendance

N. T. CHADDERDON, president, Fisher Governor Co., Marshalltown, Iowa.
P. A. ELFERS, sales manager, Fisher Governor Co., Marshalltown, Iowa.
RALPH BURKE, manager refinery division, Sivyer Steel Casting Co., Milwaukee.
J. E. DURSTON, district manager, Peerless Pump Division, Food Machinery Corp., Los Angeles.
C. A. COWLES, JR., district manager, Yarnall-Waring Co., Philadelphia, Pa.

Refinery and natural gasoline plant engineers and operators will be particularly interested in the equipment exhibited. Recent developments in the field of pressure regulation and liquid level control will be shown. Of particular interest will be the Fisher Level-trol, which, it is stated, is a marked advance in liquid level control, using the displacement principle and departing entirely from the old kidney floats. These units suitable for operating pressures up to 3,500 pounds will be on display. The Fisher-King automatic booster control will be demonstrated, the purpose of this unit being automatically to boost the control pressure in accordance with the load demand.

A Peerless deep well turbine type pump will be in operation, alongside of a cutaway section of the various working parts of the unit. A new development, the Peerless Hi-lift pump, consisting of a single stage rotor capable of handling nominal quantities at unusually high pressures, will be shown.

The Barco flexible ball joint will be shown in an exhibit demonstrating its flexibility. This joint has been used very extensively in steam line and mud line connections in the oil fields.

A working model of the Yarway impulse steam trap will demonstrate its principle of operation. Construction will be in the standard forged steel body with heat treated stainless steel trim.

Sivyer steel castings, both return bends and tube sheets, will be displayed. These units will be shown in detail, of particular interest being sectionalized segments of a fitting of 4-6 per cent chrome, 0.5 per cent moly, for 1,000 pounds, 1,000 degrees service.

Darling Valve & Manufacturing Co.
Williamsport, Pa.

Booths 351, 353, Coliseum

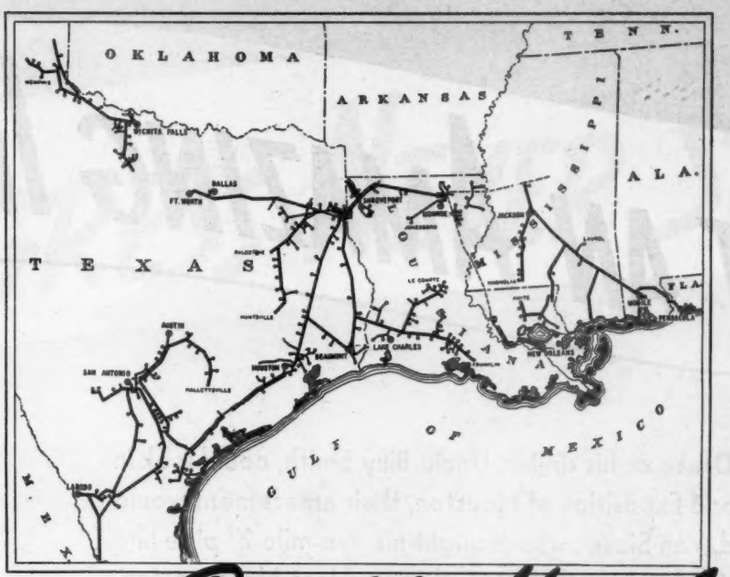
In attendance

J. S. KIESEL, chief engineer
M. L. HOUGH, vice president and treasurer

Exhibit will include a unique mechanical model of the Darcova valve cup selector recently introduced to oil country trade. The information contained on the large-scale mechanically-driven selector is identical to that on the smaller selectors.

The display will also include the company's forged

(Continued on Page 174)



Dependable Natural Gas

DOES SO MUCH...COSTS SO LITTLE!

In the oil industry, Natural Gas can be used to great advantage. As a fuel for the production of steam used in drilling, it is unsurpassed. Ever at hand, under constant pressure and uniformly efficient, it will do the job quickly and economically. As the means for repressuring and other lease operations, including make-up for pressure maintenance, it is equally satisfactory and economical.

★ Our pipe lines form a network over the Southwest. There is probably one near your location. A phone call or letter to any office or employe of the Company will bring immediate action.

★ Use Natural Gas, and solve your fuel problems!

UNITED GAS
PIPE LINE COMPANY

St. Louis
requests the pleasure of your company at the
HOTEL
Mayfair
8th and ST. CHARLES
50% OF ALL ROOMS, $3.50 OR LESS, SINGLE
$5.00 OR LESS, DOUBLE

FLOORING OF SUPERIORITY

1. Non-slipping
2. Safer
3. Stronger
4. Better Ventilation
5. Cleaner
6. Fireproof
7. Better Fitting
8. Easier to walk, work or wheel upon.

A non-slip perfect traction floor for refinery and tank platforms, walkways and safety steps. Also for areaways, trench covers, boiler room floors and bridges, with a choice of designs for any span or load.

Oklahoma Rep.: L. H. Saunders, P. O. Box 1183, Tulsa
Tel. 3-7186. *Write for Catalog.*

Kerlow Steel Flooring Company
218-0 Culver Avenue Jersey City, N. J.

COLONEL DRAKE WOULD SAY...

"WHAT AN AMAZING INDUSTRY..."

If Colonel Drake or his driller, Uncle Billy Smith, could look in on the Oil World Exposition at Houston, their amazement would be unbounded. Van Sickel, who thought his five-mile 2" pipe line at Pithole was too long, would be struck speechless. No less astonished would be the other pioneers who worked and dreamed for the development of America's petroleum wealth.

Yet . . . farsighted, pioneering as these men were, they could not have envisaged the oil industry as it is today.

The oil industry is *still* on the march. Changes in methods and practice take place overnight. To show the latest developments in oil field equipment, The Continental Supply Company and Associated Exhibitors have arranged a comprehensive exhibit at the Oil World Exposition in Houston, April 24-29. To this show and to Continental's exhibit you are most cordially invited.

THE CONTINENTAL SUPPLY COMPANY
DALLAS, TEXAS

IT'S PROGRESS NEVER STOPS!

OIL WORLD EXPOSITION ~ HOUSTON, APRIL 24-29

ASSOCIATED EXHIBITORS

Broderick & Bascom Rope Company • • Clayton Mark & Company
Climax Engineering Company • • D+B Pump and Supply Company
Emsco Derrick & Equipment Co. • • The Falk Corporation
Fairbanks, Morse & Co. • • Farrar & Trefts, Inc.
Gardner-Denver Company • • The Mechanical Rubber Company
New Bedford Cordage Co. • • Westcott Valve Company
The Youngstown Sheet & Tube Co.

•

Booths No. 298 • 299 • 332 • 334 • 336 • 340
429 • 431 • 433 • 435 • 437 • 441

CONTINENTAL

"Serving the Oil and Gas Industries"

steel, double disc gate valves for drilling through and flow line service; Darval semisteel double disc gate valves and check valves for pipe lines and gathering lines, and all bronze gate valves.

Darcova valve cup selector

The company's improved cast steel taper seat valve is shown in cut-away section, driven by an electrical operating unit. A high-pressure fire hydrant for refinery service and industrial use is also shown.

Daniel Orifice Fitting Co.
Los Angeles, Calif.

Space 1575-B, Annex

Davis Regulator Company
Chicago, Ill.

Booths 726-728, Coliseum

In attendance

GEORGE C. DAVIS, president
GEORGE HACHMEISTER
R. A. PETERSON

The exhibit, in conjunction with that of Westcott and Greis, Inc., of Tulsa, Dallas, and Houston, its Mid-Continent and Gulf Coast representatives, will include automatic valve specialties and liquid level controllers of interest to the producers and refiners. The recently redesigned line of Davis gas back pressure valves and Supersensitive relief valves will be featured. A new line of spring loaded gas back pressure valves will be shown. Other products include the packless float box with indicating signals and pilot valve for remote control, lever operated valves, pressure regulators, diaphragm motor valves, and strainers.

The Dayton Rubber Manufacturing Company
Dayton, Ohio

Booths 1510, 1512, Annex

In attendance

K. H. GLANTON, vice president in charge of mechanical sales
T. C. DAVIS, sales manager, industrial division
E. P. SPORE, district sales manager
L. K. SHERMAN, district representative
R. H. HOHMAN, district representative

Displaying the company's cog-belt drive which it states was developed as a result of seven years of tests and research by its technical laboratories, Super-Flex cog-belts with Daytex cord in their neutral axis section, it is stated, reduce maintenance expense to a minimum. This new cog-belt, it is said, has greater life, efficiency, and requires less adjustment due to the fact that Daytex cord has greater tensile strength, less stretch, and greater resistance to heat.

Dedman Foundry & Machine Co.
Houston, Tex.

Booth 1119, Annex

In attendance

H. W. DEDMAN — C. E. NEWTON
L. J. GUENTHER — J. L. BLAIR
C. K. FLAGG

Exhibiting large bottom pour ladle and various steel castings.

C. B. Delhomme—Marine Distributor
Houston, Tex.

Booth 1028-B, outside

In attendance

C. B. DELHOMME — JOHN WINTER
J. R. SMITH — LAWRENCE DOHERTY
BILL FORREST

Exhibit will feature marine equipment with special attention to cruisers, runabouts, outboard motors and boats, and Evinrude high-pressure centrifugal force pumpers, widely used in seismograph work. Also displaying a 34-foot Matthews, twin screw cruiser, a new model in production this year; two Gar Wood streamlined cabin utility runabouts, and a complete display of all model Evinrude and Elto outboard motors and boats. The Matthews cruiser is the first ever displayed in the South.

Diamond Chain & Mfg. Co.
Indianapolis, Ind.

Booths 1138, 1140, Annex

In attendance

J. L. WAMSLEY — W. A. WARRICK
H. L. MARTIN

Complete display of roller chains as used on pumping units and for drilling and servicing equipment along with sprockets with which these chains operate and also several sizes of the company's new and improved double chain type flexible shaft coupling. Enlarged photographs of actual map of the United States showing localized stocks as carried by the company's distributors throughout the Southwest. Typical oil country chains which will be on exhibit will display the various parts and careful workmanship incorporated in making these chains for oil country use.

Diesel Equipment Co.
Chicago, Ill.

Space 1626

Dixon Valve & Coupling Company
Philadelphia, Pa.

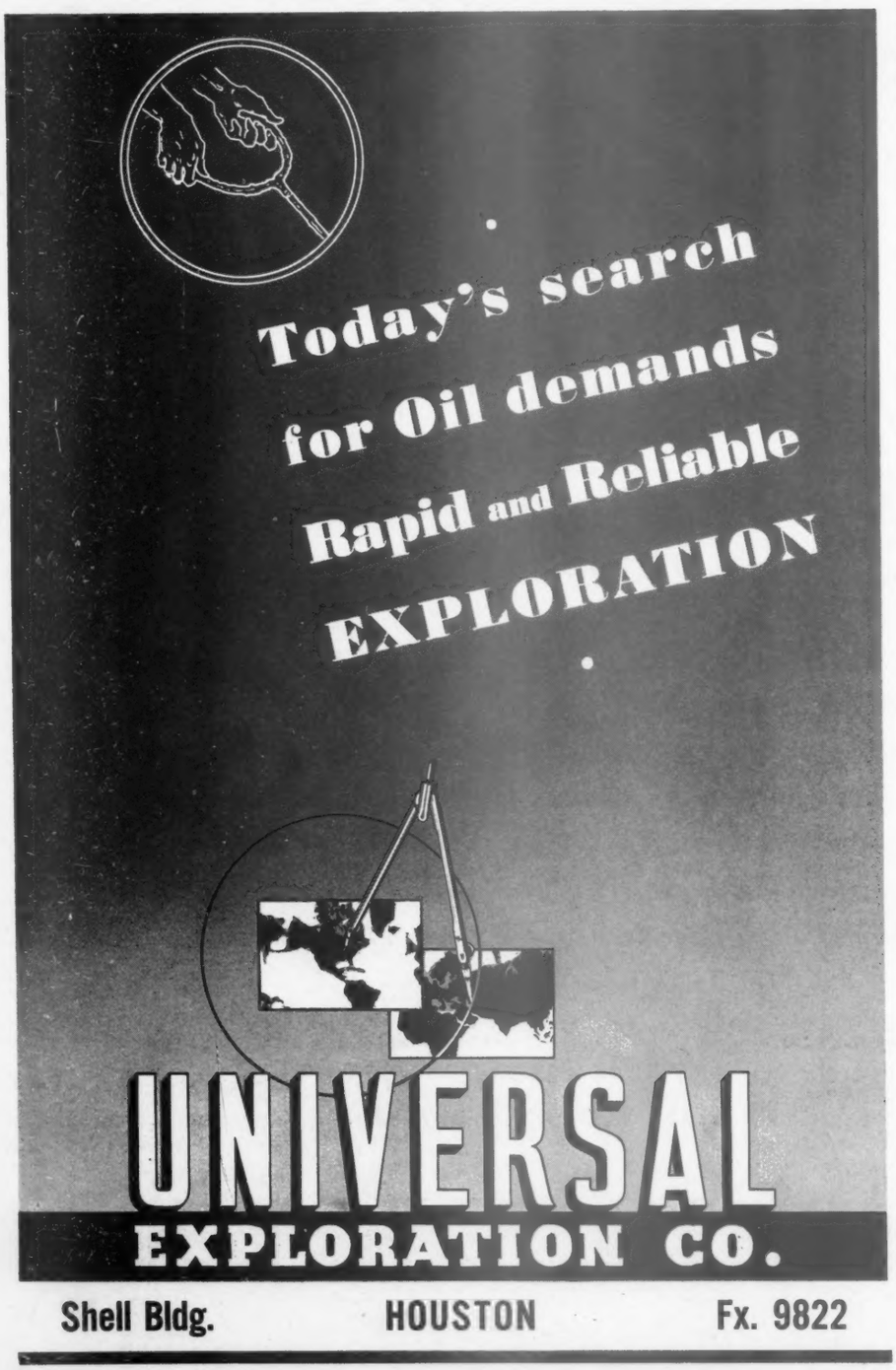
Booths 533-535

In attendance

J. E. BOBO, local representative
S. J. YERKES, factory representative
R. B. GOODALL, factory representative

Displaying a general line of quality high-pressure hose couplings, stressing those units most suitable for rotary hose service. The outstanding feature is the new

(Continued on Page 179)



"Dixon" built-in rotary coupling—making its first public appearance. The construction of this coupling is shown completely by a demonstration model illustrating the functions of the various members of hose and their relation to the coupling.

Dodge Manufacturing Co.
Mishawaka, Ind.

Space 1501, 1503, Annex

Dodge Manufacturing Corporation
Houston, Tex.

Space 1501, 1503, Annex

Double Seal Ring Co.
Fort Worth, Tex.

Space 230, Coliseum

Dowell, Incorporated
(Subsidiary of Dow Chemical Co.)
Tulsa, Okla.

Booths 151, 153, Coliseum
In attendance

A. P. BEUTEL, president and treasurer, Midland, Mich.; N. R. CRAWFORD, vice president and manager, Tulsa; J. G. STAUDT, assistant manager, Tulsa; W. E. REARDON, assistant manager, Tulsa; R. D. SHAW, sales manager, Tulsa; H. W. ROSS, assistant sales manager, Tulsa; F. I. McCONNELL, assistant sales manager, Fort Worth, Tex.; C. E. MANGOLD, district manager, Shreveport, La.; C. T. YOUNG, district manager, Houston, Tex.; F. R. HOLLAND, district manager, Stamford, Tex.; W. J. RUSSELL, district manager, Midland, Tex.; J. L. COSS, sales engineer, Tulsa; J. H. ADKINSON, sales engineer, Tulsa; G. F. WILLIAMS, sales engineer, Tulsa; K. L. FLANDERS, sales engineer, Longview, Tex.; P. E. FITZGERALD, geologist, Tulsa; S. C. MORIAN, district engineer, Houston, Tex.; E. R. FRITZ, sales engineer, Shreveport, La.; D. G. HEFLEY, research engineer, Tulsa.

Dowell products: Dowell "X"—Inhibited hydrochloric acid for increasing oil and gas production from limestone and dolomitic reservoirs.

Special acids to meet varying requirements in specific areas—Dowell "XX"—for speeding up reaction rate in dolomitic formations. Dowell "XR"—to retard reaction rate with fast reacting formations and obtain deeper penetration. Dowell "XF"—to permit easier penetration in tight wells. Dowell "XW"—to prevent emulsions, increase wetability and afford greater penetrating power. Dowell "XG"—to remove lime scale from face of pay in wells producing water.

Solvents—for chemical removal of paraffin deposits. Dowell Orange—to remove pure paraffin accumulations. Dowell Red—to remove accumulations with high asphaltic content. Dowell Green—for unusual and peculiar types of paraffin found in specific areas.

Formation plugging—a chemical method to exclude unwanted water and gas from wells.

Dowmetal Casing—a light weight magnesium pipe for use in wells producing from two or more horizons.

Dresser Manufacturing Company
Bradford, Pa.

Booths 1128, 1130
In attendance

H. P. BONCHER, sales manager; C. T. DAVIS, district manager; H. R. SHIDEL, district manager, oilfield division.

On display a complete exhibit of Dresser pipe couplings and repair devices for the construction and maintenance of pipe lines. Included will be Dresser steel couplings, fittings, repair clamps, and repair sleeves. An interesting feature of the exhibit will be an actual demonstration of a flexible pipe joint. A pipe line will be maintained at a pressure of 100 pounds per square inch and a joint on this line will be moved up and down through a 4-degree arc by an eccentric. A counter will keep track of the number of deflections, which on previous exhibits has run as high as 625,621 times before the show closed. The company calls this the pipe joint that "lives and breathes."

E. I. du Pont de Nemours & Co.
Wilmington, Del.

Booths 1124, 1126, Annex
In attendance

V. A. COSLER ALLEN F. CLARK
H. LOGAN LAWRENCE

Will exhibit neoprene products used by the entire petroleum industry. Neoprene is an engineering material which resembles natural rubber in strength, resilience, elasticity and abrasion resistance but resists the deteriorating effects of oils, gasoline, heat, ozone, oxygen, chemicals and aging. Because of these characteristics, neoprene is widely used in the oil industry where it is reported of value in increasing the life of resilient products, insuring greater reliability of operation, and enabling the creation of products which would not otherwise be practical.

Products made of neoprene or products which include neoprene to be displayed include rotary hose, packers, slush pump pistons, submarine hose which has transported 22,000,000 bbls. of oil, gasoline pump hose, fuel oil hose, safety shoe soles, cable, oil-proof sunlight-resisting clothing, valves, couplers, saddles and molded goods. Also on display will be the unique new Mareng fuel cell (a vibration-proof and oil-proof fuel tank) and tankcar and other valves.

The display will consist of transparencies showing services of neoprene products; a diorama of a producing field where neoprene is used; a triplane photographic presentation of uses of neoprene in marketing and working demonstration of the abrasion resistance of oil-soaked neoprene products.

Duff-Norton Manufacturing Company
Pittsburgh, Pa.

Booths 719, 721
In attendance

C. N. THULIN H. C. GARDNER

Showing a complete line of the company's automatic lowering jacks of which the new and improved No. 1523 general purpose jack is of particular interest to the oil field. Capacity—15 tons. Application—for straight lifting, chain lifting, hook lifting, and foot lifting. A newly improved single-unit automatic lowering mechanism provides a new measure of long service and smooth, easy lowering. This oil-tempered, spring-actuated mechanism is self-contained in a housing and can easily be removed bodily from the jack

THE "doodle-bug" IS DOING 24-HOUR DUTY IN THIS OIL "CAPITAL"

What's going on in and around Evansville is not an occasional "spurt"—but a steady, rapidly increasing volume of activity. New production levels are reached from day to day; new openings are reported, new pools discovered — demonstrating THROUGH ACTION, that within this new oil-proven territory, Evansville is the coming center — Evansville is the key to profit opportunities for producers and equipment operators alike. Such positive results, backed by the comprehensive service facilities and modern accommodations offered by this strategically located industrial community, make Evansville the logical headquarters for your operations in the Southwestern Illinois-Western Kentucky-Southern Indiana fields.

WRITE, WIRE OR PHONE FOR DETAILED INFORMATION ON PRODUCTION AND FACILITIES

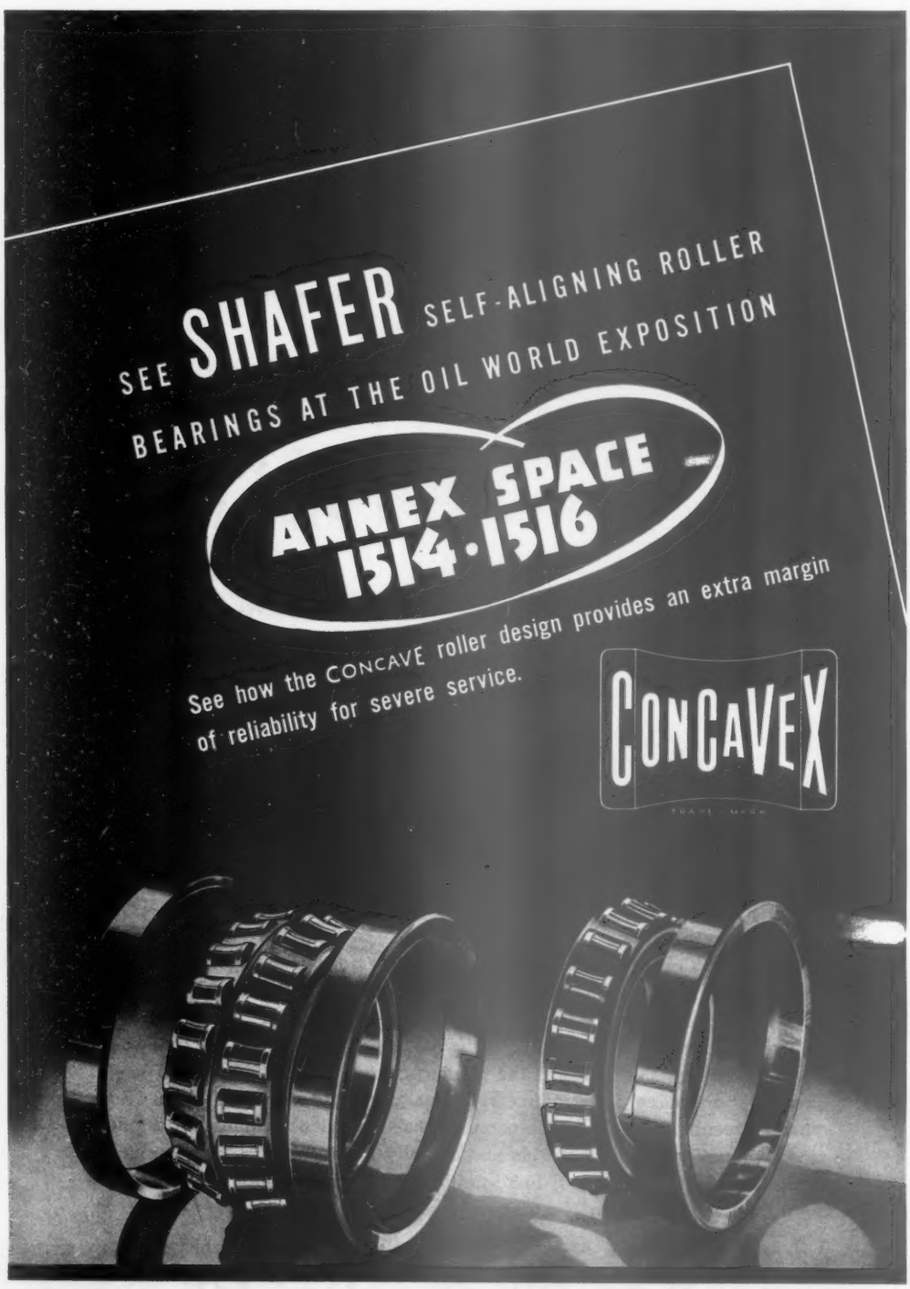
EVANSVILLE INDIANA "The Capital of Three Oil Fields"

Evansville Chamber of Commerce

EVANSVILLE INDIANA

for occasional adjustment or renewal. The entire mechanism is contained in coverall housing to protect the vital parts from dirt or exposure. The swivel base permits lifting at various angles for shoving, pushing or post pulling while the positive latch permits upright lifting in absolute safety. Light in weight, the jack is an ideal one-man jack with a multitude of uses. It is equipped with double socket lever for operation in cramped quarters.

The company will also exhibit the latest development in bell base screw jacks. These jacks in 38 sizes have solid one-piece cast-steel base and double-ribbed collar reinforcement around threaded area of casting to insure added strength. One-piece steel screw has forged steel head surmounted by unbreakable drop-forged steel top firmly attached without use of pins. Load friction reduced to minimum by use of chrome molybdenum steel balls which rotate in machine-cut, grease-packed channel beneath drop-forged top, assuring smoother lifting action with minimum of effort under heavy loads. Roller bearing device also prevents jack from twisting under load. Smooth-surface machine-cut threads of correct pitch, depth, and thickness facilitate handling rated capacities safer, faster, and easier.


SEE SHAFER SELF-ALIGNING ROLLER
BEARINGS AT THE OIL WORLD EXPOSITION
ANNEX SPACE
1514-1516
See how the CONCAVE roller design provides an extra margin of reliability for severe service.
CONCAVEX
SHAFER BEARING CORPORATION
35 East Wacker Drive • Chicago, Illinois

Gil V. Dye Co.
Houston, Tex.

Spaces 1502, 1504, 1506, Annex

Eastman Oil Well Survey Company
Dallas, Tex.

Booths 320, 421, Coliseum

In attendance

RAY F. BOLTON, vice president
ROSS E. WILEY, vice president, California manager
AL G. PABST, sales manager

Products to be exhibited:

Survey instruments—Multiple shot survey instrument, orienting system, regular open-hole single shot, inside single shot, photographic drift indicator, Type "M" drift indicator, acid bottles.

Deflecting tools—Open-hole removable whipstock, hydraulic spudding bit, hydraulic whipstock (casing permanent), open-hole permanent whipstock.

Bits—Hydraulic expanding underreamer, rock type pilot reamer, directional bits.

Casing roller.

It is stated a new degree of accuracy is brought to the art of multiple shot surveying, both oriented and magnetic, by the new equipment. The instrument is powered by four heavy clock type springs, thus giving a safety factor of operation, and although it is smaller in diameter, and also length, it is generally more rugged in construction.

The outstanding features of the orienting method and equipment are simplicity of operation, and, it is stated, the absolute elimination of the human error possible in older methods of visual observation and recording. At each stand, the total angle of rotation of the drill pipe with respect to the known azimuth is photographically recorded by merely pushing a button. Thus, in one step are eliminated both human and cumulative errors.

In addition to the regular 1½-inch O.D. photographic drift indicator, the company has now available a seven-eighths inch O.D. instrument of the same type. An outstanding achievement in the drift indicator line is the Eastman Type "M" indicator. This instrument is a photographic type, but is outstanding in that the film does not have to be developed. No loaders or unloaders are necessary, and still it has all the desirable qualities of the photographic indicator, i.e., positive proof the instrument was on bottom and not moving, and absolute accuracy.

A new note in the operation of the old single shot is the single fluid introduced by the company, which replaces both the developer and fixer solutions. The film is permanently fixed in less time with no possibility of over or under developing. All chance of error in using the wrong solution first is eliminated.

Edward Valve & Manufacturing Co., Inc.
East Chicago, Ind.

Booths 708, 710, 712, Coliseum

In attendance

W. W. CRAWFORD, president
J. E. McDONALD, sales manager
W. W. MOHR, chief engineer
W. F. CRAWFORD, vice president, and staff of the

Maintenance Engineering Corp., Houston
Exhibiting a complete line of screwed end, flanged

ON THE GULF COAST

All along the Gulf Coast, as in other areas, we carefully dovetail our service and our merchandise with the activities of the oil industry, to achieve maximum economy, convenience and security for our customers. Any Frick-Reid Store, from the Great Lakes to the Gulf and from New York to New Mexico, offers the unusual in Products, Personnel and Performance.

VISIT OUR EXHIBIT IN THE COLISEUM AT THE
OIL-WORLD EXPOSITION HOUSTON APRIL 24-29

FRICK-REID SUPPLY CORPORATION

TULSA, OKLA.

72 Stores and 12 Offices in Old and New Fields

end, and welding end globe and angle stop valves of forged carbon and alloy steels, from tiny gauge valves for instrument lines to large screwed end forged steel hydraulic valves for 6,000 pounds working pressure. Flanged end valves include equipment suitable for the highest operating pressures and temperatures; forged and cast steel non-shock piston type and ball type check valves for pressures up to 6,000 pounds. The company's 3- and 4-inch globe and angle stop valves for use on oil field boilers, full area, remarkably compact, use EValloy trim; forged steel hydraulic valves suitable for pressures up to 6,000 pounds; non-return, feedline stop-check, and blow-off valves for all boiler operating pressures; all-steel relief valves with ball type discs and totally enclosed bonnets of interest to users of heat exchangers, pumps, and many types of unfired pressure vessels; forged steel strainers of value to users of traps, pressure regulators, pumps, etc., and forged carbon and alloy steel straight-through valves with swivel plug discs; for use on instrument and sampling lines where free, open flow is imperative.

Egner Brothers

Houston, Tex.

Booths 151, 196, Main Floor Annex

In attendance

P. O. EGNER, Houston, Tex.; PAT O'REILLY, Houston, Tex.; ED MAGNUSON, Houston, Tex.; N. H. McCLAMROCH, Houston, Tex.; H. W. WHARTON, Schramm, Inc., West Chester, Pa.; PAUL GARDNER, president, DeWalt Corp., Lancaster, Pa.; GEORGE BUVINGHAUSEN, Houston, Tex., spray painting and sand blasting contractor.

The picture shows the Gordon Smith air compressor unit which is made out of a model A and B Ford engine. This unit has been very popular with concerns in connection with sand blasting, spray painting, operation of pneumatic tools, jetting of water wells, etc. The unit attracts unusual attention when demonstrated. Other machines that will be on display and under actual demonstration will be: DeWalt combination woodworker;

Wallace No. 1 radial saw; several models of the Schramm portable and stationary air compressors, pneumatic tools; sand blast machines; spray painting equipment; light and high displacement gasoline-driven air-compressor units designed for spray painting manufactured by P. K. Lindsay & Co., and other electric hand saws, drills, etc.

Electro-Coypist of Texas

Houston, Tex.

(Distributors for the Hunter Electro-Copyist, Inc., Syracuse, N. Y.)

Booth 1220, Annex

In attendance

F. T. SIMMONS, manager of Electro-Copyist of Texas, Houston; J. G. HEYWOOD, sales manager, Electro-Copyist of Texas, Houston; B. L. CUMBER, vice president and sales manager of Hunter Electro-Copyist, Inc., Syracuse, N. Y.

Exhibiting Hunter Electro-Copyist, photographic reproducing machines, reproducing any original on one or both sides, with photographic accuracy operating under ordinary light, using no lens, requiring no focus or dark room.

Electro-Copyist machines are available in two portable models with copying capacity of 10 by 16 inches and 14 by 19 inches and four new stationary units, vacuum seal models, with capacities up to 30 by 42 inches, featuring first the vacuum seal created by motor-driven pump which holds the material to be copied in positive contact with the glass assuring clarity and sharpness in reproduction under all conditions; second, the newly developed amber light which eliminates the filter plate. By a simple flick of the switch either amber or white light can be used.

The space saving Unitype, with copying capacity of 14 by 19 inches, contains all features of the larger models plus built-in trays, drains, water hose and dryer shelf complete in one cabinet. Exposure time on all machines is regulated to split seconds by an automatic timer.

Emerol Manufacturing Co., Inc.

New York, N. Y.

Spaces 1520 and 1522, Annex

In attendance

B. N. PIERCE, president
C. P. PIERCE, production manager
S. W. McCANDLESS, sales manager
H. H. WHELAN, resident Texas representative
ROY L. STROUD, sales representative
MR. CROWELL, sales representative

Will exhibit Marvel mystery oil, Marvel inverse oilers, Marvel Hi-Rev and Emerol chassis oil.

The Marvel mystery inverse oiler is a sturdy, automatic precision mechanical device designed for proportioning Marvel mystery oil to the air passing through the intake manifold into the cylinders of an internal combustion engine, supplying it with lubricated air laden with Marvel mystery oil to lubricate top cylinder parts. The proportion of Marvel mystery oil through the Marvel mystery inverse oiler is promoted by the partial vacuum produced in the intake manifold while an engine is doing work. This proportion of the top cylinder lubricant, Marvel mystery oil, supplies the upper cylinder parts more oil on open throttle, or low partial vacuum at the time of high heat in an engine while power is being required

LIGHTEST, HANDIEST *High-Duty* PUMPER

FOR SEISMOGRAPH SERVICE

Here's a capable, high-pressure pump that literally *goes anywhere* . . . into muck, swamp or roadless jungle completely closed to trucks and heavy equipment.

The 62-pound Evinrude goes there and *does a job* . . . dependably supplies up to 160 pounds pressure hour after hour. The specially designed Evinrude pump unit will continuously handle water loaded with sand or silt.

The power unit is a fully enclosed 9-horsepower, 4-cylinder motor of Evinrude design. The entire outfit is 17" x 12½" x 20" high — weighs only 62 pounds—combining utmost lightness and compactness with extraordinary efficiency.

Evinrude pumpers are in successful seismograph service the world over. Write today for special descriptive literature. Address, EVINRUDE MOTORS, 4202 N. 27th Street, Milwaukee, Wis.

Evinrude Pumpers will be on display, in operation, at the Oil World Exposition, Houston, Texas, April 24 to 29, 1939.

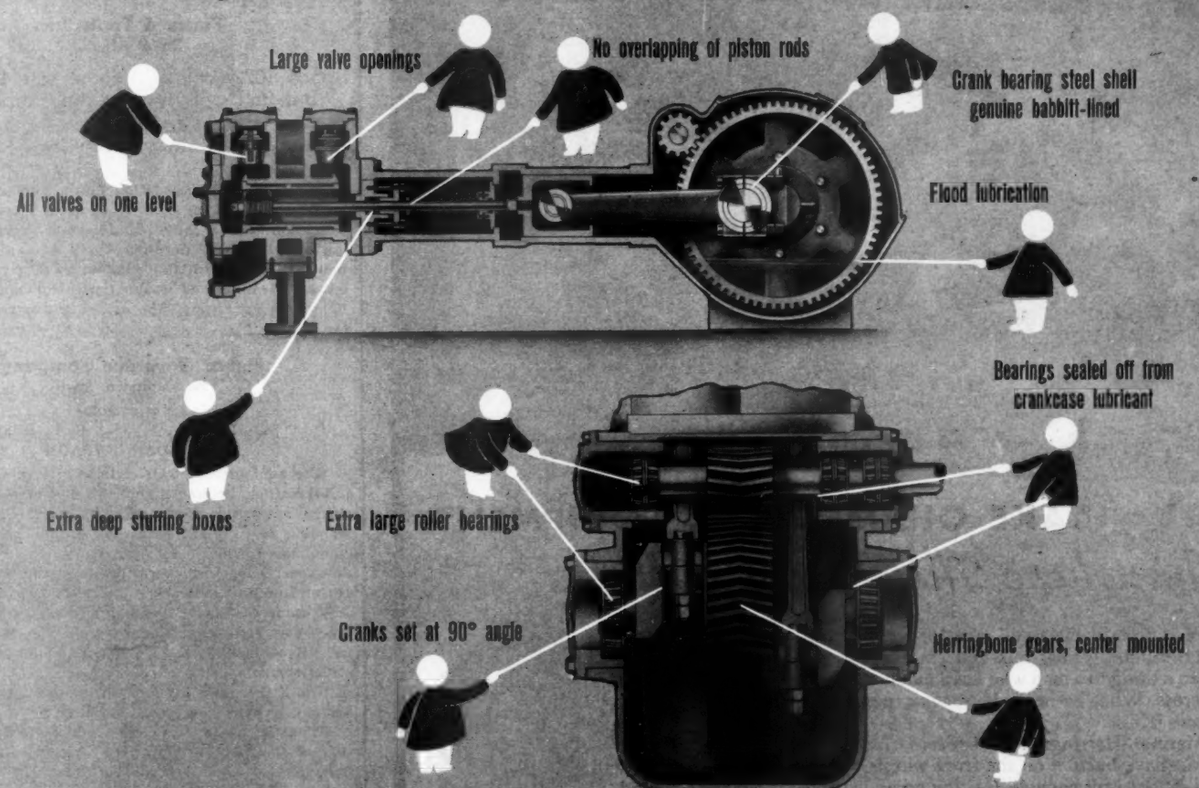
BOOTH NO. 1028B

EVINRUDE CENTRIFUGAL, HIGH-PRESSURE *Pumper*

Quiz?

QUESTION: What is the reason for the world leadership of GASO in the field of pipeline pumps?

ANSWER: Supremacy of design — based not on any single feature but on a *combination* of features developed through unmatched experience and specialized knowledge of pipeline requirements. For example:

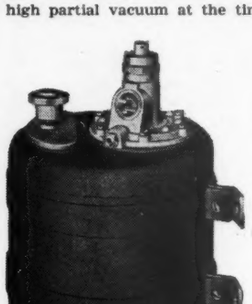

Large valve openings
No overlapping of piston rods
Crank bearing steel shell genuine babbitt-lined
All valves on one level
Flood lubrication
Bearings sealed off from crankcase lubricant
Extra deep stuffing boxes
Extra large roller bearings
Cranks set at 90° angle
Herringbone gears, center mounted

● Gaso Pumps have long been favored by engineers because they embody the kind of engineering that means long, trouble-free service and lower operating costs. May we send you a copy of our latest catalog?

Gaso Pump & Burner Mfg. Co., 902 E. First Street, Tulsa, Oklahoma. Export Office: 149 Broadway, New York. Los Angeles: Service Oil Field Supply Co., 5333 S. Riverside Drive.

GASO PUMPS
for every oil industry need

of the engine to do work, and less oil on closed throttle, or high partial vacuum at the time of minimum heat while little power is being required of the engine to do work. Therefore, the oil is supplied to the upper cylinder parts in relation to the heat generated and the power being required by an engine to do work.



The company has recently developed a top cylinder oiler of a pressure type for Diesel engines and large heavy-duty gas engines. It has the automatic feed control, in addition to the pressure feature that supplies oil at the low partial vacuum of Diesel intake manifolds.

Ensign Carburetor Co., Ltd.
Huntington Park, Calif.

Booth 6, entrance to main building

In attendance

P. W. ENSIGN — R. R. WYKER
L. C. ARTER — L. G. SMITH

Exhibiting Ensign natural gas carburetion equipment; combination natural gas and gasoline carburetion equipment; butane-propane carburetion equipment; combination gasoline and butane-propane carburetion equipment. Displaying cut-out samples of their equipment as well as numerous photographs showing its application to various types of engines in various types of service. Also a complete line of Forster torches and burners suitable for use with natural gas, manufactured gas or butane-propane vapor. This complete line of torches and burners is manufactured by the Ransome Co. at Emeryville, Calif.

Everlasting Valve Co.
Jersey City, N. J.

Space 1048, outside

In attendance

E. N. CORNING — JOHN F. STRING

Portions of the body of a 2-inch Everlasting valve have been removed so as to present for observation the movement of the internal parts and demonstrate the basic values which have established its popularity in the oil industry for the past 25 years. All parts move in parallel planes are self-adjusted and self-compensating to expansion and contraction. There is no wedging of parts. All of this results in long continuing tight service and easy operation. These features create Everlasting Emergency throttle valve—a safety factor on drilling rigs. Boiler blowoff valves will also be on display for pressures of 250 pounds, 300 pounds, 350 pounds, and 600 pounds.

Geo. E. Failing Supply Co.
Enid, Okla.

Space 1039, outside

Farrar & Trefts, Inc.
Buffalo, N. Y.

Space 1022, outside; also Booth 429, Main Building, with Continental Supply Co.

In attendance

JOHN C. TREFTS, president; S. MENSONIDES, vice president.

Exhibit: All-welded "High Power" oil country boiler. On this boiler all riveted joints have been replaced by fusion welded joints. Manufacturers claim the following advantages for this construction: Less maintenance expense with the elimination of riveted joints; quicker cleaning and washing with the smooth inside: lighter weight; neater appearance with streamlined effect.

Fisher Governor Company
Marshalltown, Iowa

In attendance

P. A. ELFERS — K. L. PUFFER
M. N. DANNENBAUM

The equipment shown includes a new wide range, full-throttling column liquid level controller for refinery and field application. It is particularly outstanding and advantageous for use on reboilers, accumulators, strippers interface control, as well as high pressure, long range throttling applications in refinery and production work.

A complete line of diaphragm motor valves, including V-port and top and bottom guided construction inner valves; handwheel superstructures or topwork constructions.

The Fisher-King gas pressure booster, an outstanding development for the gas industry.

There is also on display a sectionalized cross section of the Phlneumatic deep well gas-lift pumping unit, for economical lifting of oil with low gas-oil ratio.

In addition, a complete line of miscellaneous items of pressure and liquid level controllers is shown.

Geo. J. Fix Company
Dallas, Tex.

The Geo. J. Fix Co. will be in charge of the exhibit of the Baldwin-Duckworth Chain Corp. It will also assist at the exhibit of the Roller Bearing Co. of America and also at that of Shafer Bearing Corp.

Fluid Packed Pump Company
Los Nietos, Calif.

Booths 309-311, Coliseum

In attendance

ROBERT J. MILLER, Houston, Tex.
CLYDE ELLWOOD, Oklahoma City, Okla.
FRANK R. NORRIS, of California

Will display oil well pumps and accessories. The

MARMON-HERRINGTON

All-Wheel-Drive FORDS

TAKE OIL MEN AND EQUIPMENT

Anywhere They Want to Go

• You can't blame an oil man for being "hard-boiled" about trucks. High sounding sales talk and extravagant advertising claims don't mean a thing to a man who has a mountain range, a swamp or a desert to cross. What he needs is *traction*, just as much as power, and he knows it!

Marmon-Herrington *All-Wheel-Drive* heavy duty trucks and Ford trucks have *traction* on the front wheels, *traction* on the rear wheels, and if that isn't enough, *traction* on an extra pair of wheels behind. That is why major oil companies operating in this country, in South America, Europe and Asia are buying more and more of these vehicles every year. They know that Marmon-Herrington *All-Wheel-Drives* are "performing fools" for all sorts of off the highway service—and that they have the stamina to stand the gaff in the worst kind of going.

Chassis Only, or Completely Equipped

We have the experience and facilities to mount any special apparatus or equipment required for seismograph scouting, transport of personnel or hauling heavy machinery. Write for special literature, *or see us at the Houston Oil Show.* Cable address, MARTON.

MARMON-HERRINGTON COMPANY, INC.

INDIANAPOLIS, INDIANA, U. S. A.

three types that will be shown are the fluid packed pump, recommended where extreme sand conditions prevail; groove-seal pump, which is an improved precision fit tube type pump, recommended for practically all types of wells, with large cross sectional area and the tubing liner pump, which has earned a reputation by its performance in volume wells. The positive automatic standing valve puller is a special feature of this pump.

Ford Motor Company
Detroit, Mich.

Space 1025-1030, outside

C. G. Forshey
Houston, Tex.

Space 1577, Annex

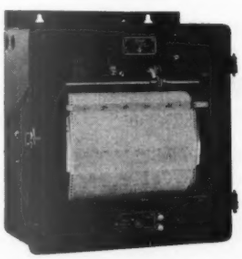
Foxboro Co.
Foxboro, Mass.

Booth 1222

In attendance

G. B. LANE, manager, Dallas office; J. B. McMAHON, manager, controller division; J. J. BURNETT, manager Chicago office; H. G. GRIFFITH, manager Houston office; E. L. STARK, sales engineer; C. L. BRYAN, sales engineer; E. A. THOMAS, sales engineer; J. HEINZERLING, sales engineer.

An instrument exhibit will feature recent developments in the line of pyrometric instruments. On each



side of the central instrument panel will be shown illuminated photos of Foxboro installations in the oil fields.

Display will include the newly developed Stabilog potentiometer recording controller, the key switch cabinet and potentiometer indicator unit, single and multiple record potentiometer recorders, flush mount-

ed potentiometer controller, and a pipe still control unit. In addition to the pyrometric instruments there will be shown the company's pneumatic transmission system, cut models of a flow meter and a Stabilflo valve.

Frick-Reid Supply Corporation
Tulsa, Okla.

Booths 350, 352, 354, 356, 451, 453, 455, 457, Coliseum

In attendance

J. L. SHAKELY, president

ROBERT McCOY, JR., vice president

H. H. WILSON, sales manager

V. V. McGREW, district sales manager, Gulf Coast, Houston, Tex.

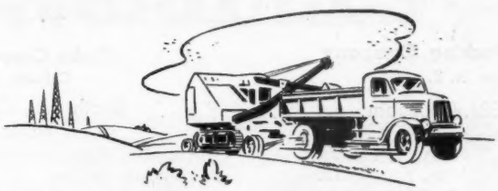
C. B. MOORE, city sales manager, Houston, Tex.

Manufacturers whose products will be included in the exhibit will be: Gilmore Wire Rope Division, Jones & Laughlin Steel Corp.; Joseph Reid Gas Engine Co.; Beaumont Iron Works Co.; Axelson Manufacturing Co.

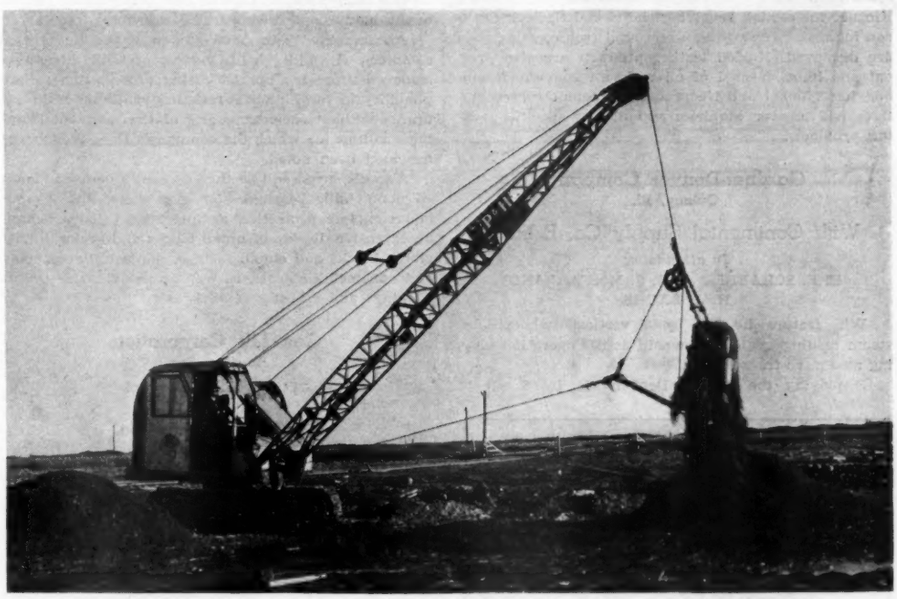
Included in the Frick-Reid Supply Corp. exhibit, is the Reid "Terrier", built by the Joseph Reid Gas Engine Co., of Oil City, Pa. The Terrier, an engine of the single cylinder, two cycle, horizontal type, has several improvements over the original design first offered to the trade about one year ago. The Terrier is built in two sizes: 7½ by 9-inch and 8¼ by 9-inch, as a gas or oil engine, and convertible from one fuel to the other. Horsepower ratings: 7½ by 9; gas, 14 hp. to 30 hp.; Diesel, 11 hp. to 24 hp.; 8¼ by 9; gas, 16 hp. to 37 hp.; medium compression oil, 13 hp. to 30 hp. The Terrier has the approval of the field and many are in service as prime movers on single well units, central powers, water pumps, compressors, etc.

Featured in the design of the Terrier are Timken main bearings, removable cylinder head, metallic piston rod packing, patented crosshead and piston rod clamp connection, controls all conveniently mounted in a unitized assembly, with the control box mounted at the cylinder end of the frame. It is entirely enclosed, dustproof, and oil tight, and all working parts are readily accessible for inspection or adjustments.

The Terrier is equipped with the Reid patented power takeoff, an assembly that includes Timken bearings, Reid cone clutch, and either V-belt or flat-belt pulley. It is also equipped with a Reid idler, attached to the engine frame. The idler is adjustable and the idler pulley is mounted on Timken bearings. The Terrier also has a radiator mounted directly on the engine frame, with fan being V-belt driven from the engine crankshaft.



ACROSS THE COUNTY FOR 50c
TO MAKE A PROFIT ON "FILL-IN" WORK!



P&H EXCAVATORS

You can pull them around at motor car speeds, these P&H Bantam Weights! On their own trailers it's easy—and profitable to keep them busy on such small jobs as filling in slush pits, digging basements, handling materials, etc.—jobs that are scattered all over the map!

Built of tough alloy steels, these P&H excavators have simple attachments which enable you to convert them for seven kinds of work. You'll see them by the hundreds around the oil fields. Shall we tell you why? Ask for literature on the size that interests you. Harnischfeger Corporation, 4527 W. National Ave., Milwaukee, Wis.

3/4 YARD
1/2 YARD
3/8 YARD

HARNISCHFEGER
CORPORATION
EXCAVATORS • ELECTRIC CRANES • ARC WELDERS P&H HOISTS • WELDING ELECTRODES • MOTORS

Fruehauf Trailer Company
Detroit, Mich.

Booth 1016-A

In attendance

J. W. YOUNGBLOOD, manager Dallas branch, and others.

Will display a tank trailer and a pole trailer.

Gar Wood Industries, Inc. (Winch Division)
Detroit, Mich.

In attendance

G. E. ROBINSON, manager, Gar Wood winch division

B. A. COOPER, sales engineer

The Mead-Morrison winch division of Gar Wood Industries, Inc., Detroit, will exhibit a complete new line of Gar Wood oil-field winches, consisting of eight winch models ranging from the smallest to the largest sizes, embracing capacities up to 70,000 pounds, single line pull.

The Garlock Packing Company
Palmyra, N. Y.

Space 519-521, Coliseum

In attendance

W. A. REDD, JR. — A. T. CRUMP
FORD WILDERS — W. L. MIKELL
R. M. WAPLES — R. I. HAMILTON
A. C. GUSTAFSON

Exhibiting a complete line of mechanical packings for use in all branches of the petroleum industry, including products for pressure, heat and chemical installations. Visual moving exhibits of the Garlock Klozure for sealing revolving shafts and Garlock Chevron for maintaining pressure around reciprocating rods are displayed. Molded leather products are also present and items formed of oil resistant compounds embodying Thiokol and Neoprene. Competent representatives will answer inquiries and discuss specific packing problems.

Gardner-Denver Company
Quincy, Ill.

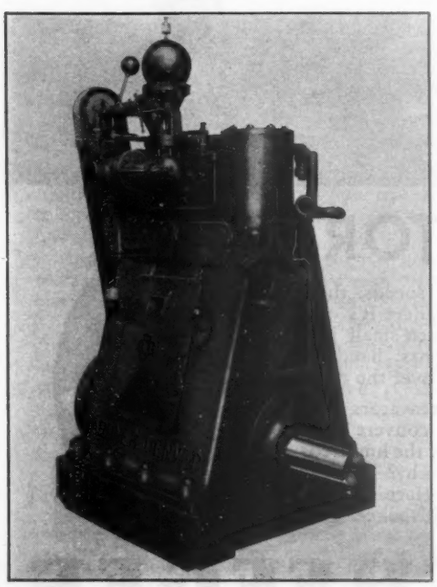
With Continental Supply Co. Exhibit

In attendance

E. F. SCHAEFER — R. J. MacFARLAND
R. J. BAUER

Will feature its 9½ by 8 vertical twin-cylinder steam drilling engine, shown in actual operation driving an Emsco transmission.

Displaying the Gardner-Denver 9½ by 8 engine



suitable for driving the rotary table directly and at the same time having sufficient power to serve as a standby for driving the drawworks. The engine is also suitable for driving a mud pump by means of V-belts, flat belt or chain drive. The engine is reversible and is of the adjustable cutoff type. The cutoff is adjusted manually and is easily set to meet load requirements. Steam valves are of the inside admission piston valve type. The valves are tight under high pressures and with superheated steam. Steam cylinders are insulated with mineral wool covered by sheet steel. Each end of each cylinder is equipped with an automatic dump valve. All moving parts are completely enclosed against dust and dirt and flood lubricated by a combination splash of pump system. The crankshaft is of forged steel. Connecting rods are of the marine type. Cross-heads are of alloy cast steel fitted top and bottom with lead bronze shoes. Piston rod stuffing boxes and oil stop heads are fitted with metallic packing.

Garrott Brass & Machine Co.
Houston, Tex.

Spaces 613, 615, Coliseum

Gates Rubber Co.
Denver, Colo.

Space 1328, 1330, Annex

Gatke Corporation
Chicago, Ill.

Booth 700, Coliseum

In attendance

THOMAS L. GATKE, president
J. D. JOHNSON, JR.
LEE BOSWELL

The company announces its exhibits will include its 445 moulded asbestos brake block—a revolutionary friction material that combines the unique quality of rapid heat dissipation with great holding power at all service temperatures; smooth feed off; positive pick-up at all depths; and incomparable resistance to wear.

An improved Deep-Well woven brake lining that combines flexibility with noncompressible density—achieved through a special curing process that retains pliability in the high-heat-resisting synthetic resin saturants without sacrificing any of the many outstanding qualities for which the company's Deep-Well woven has long been noted.

Also displayed will be the company's genuine moulded nonmetallic bearings—for long wear, low friction, and complete protection against scored journals, and an extensive display of brake blocks and brake linings, clutch blocks and clutch facings, nonmetallic bearings, and nonemetallic gears, as well as an extensive line of packings and asbestos textiles.

Gas Lift Corporation
Houston, Tex.

Space 1215, Annex

General Electric Co.
Schenectady, N. Y.

Space, Mid-Continent Supply Co. section and Spaces 1532, 1534, Annex

General Engineering & Model Works
Pittsburgh, Pa.

Space 1628, Coliseum

General Metals Corp.
Oakland, Calif.

Booth 1578, Annex

L. H. Gilmer Company
Tacony, Philadelphia, Pa.

Booth 767

In attendance

M. R. OBERHOLZER, sales manager
D. A. CANT, district manager, Oklahoma
C. P. WILLIAMS, district manager, Texas
FRED SINTES, JR., district manager, Louisiana
C. O. MITCHELL, district engineer, Chicago

Exhibiting Gilmer V-belt in multiple sizes and V-sheaves, also Kable Kord flat belting.

Goodall Rubber Co. of Texas
Houston, Tex.

Booths 750, 752, Coliseum

In attendance

H. BARNARD — D. D. COOPER

Displaying samples and descriptive literature illustrating products such as air, water, steam, and oil hose; Newtype hose for suction and discharge service in various types for handling water, oil or distillate. As usual the feature will be a Longlife rotary hose equipped with Barney couplings.

Grant Oil Tool Company
Los Angeles, Calif.

Booth 1580, Annex

In attendance

T. J. MULLINS — NORMAN H. WEST
JOHN GRANT, president

Featuring the company's roller-bearing cutter reamer with unusual construction features. The cutters are mounted at such an angle they provide a cutting and shearing action and always in contact with the formation whether being raised, lowered or rotated.

The company's 2-blade hydraulic expansion wall scraper with an expansion range of from 4 to 40 inches will also be shown. It emobdies a patented feature known as the circulation control head which, it is stated, results in practically the elimination of wear on the inside assembly by controlling the sand-laden fluid.

Underreamers and rotary hole enlargers will be demonstrated, combining both hydraulic and spring expanding action, as well as hydrostatic bailer and hydrostatic perforation cleaner, adjustable liner puller, liner hangers, lightning change cement head and circulation head.

Gray Tool Company
Houston, Tex.

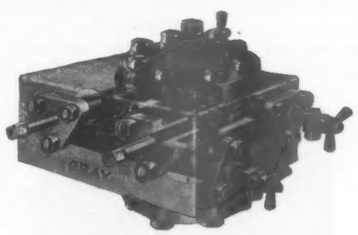
Booths 444, 446, 448, 545, 547, 549, Coliseum

In attendance

R. A. MUELLER, president
ROGER SMITH, vice president
C. E. RICHARDS, sales manager
J. R. YANCEY, chief engineer
RAY E. KOLLAR — JOHN LEMLEY
EARL M. WEAVER — C. E. HEATH

Products to be exhibited: The company's swivels, fishing tools, back-up tools, float valves, and systems of well control and accessories including valve removal tools.

The composite manifold is the final stage in the company's system of well control. The principal advantages of this manifold are stated to be concen-



tration of parts effecting true economy without sacrificing quality; all the advantages of a two-wing manifold; all working parts easily repaired or replaced; in no way affects other operations on the well.

The valve removal tool is used for removal, under equalized pressure, of valves or fittings from any part of a christmas tree; to repair damaged or leaky valves without killing the well; to remove excess valves for use elsewhere; to replace obsolete parts with improvements; to install additional valves and fittings if required.

The Type "B" swivel, capacity 422,000 pounds at 100 r.p.m. with balanced design and thorough utilization of proper materials, it is stated, has the following advantages: Bearings and mountings especially made for deep drilling and high rotating speeds; forged heat-treated alloy steel suspension members; load carried from the bottom; true Apex main bearing for easy rotation at all speeds and loads; lubricated, non-adjustable wash pipe packing unit; lubricated ball bolt pins; stem mounted with three roller bearings to assure perfect alignment; oil reservoir to maintain proper lubrication for upper bearing; maximum strength, minimum weight; low maintenance cost.

Gresham Sales Co.
Houston, Tex.

Spaces 1525, 1527, Annex

Greene, Tweed & Co.
New York, N. Y.

Booth 1567, Annex

In attendance

FRANK J. HILL, sales manager; NORMAN W. WALLINGFORD, western representative.

Exhibit will consist of company's complete line of lubricated packing including: Palmetto packing for steam, compressed air, and hot water; Palco packing for cold water and centrifugal pumps; Pelro packing for refinery and oil field service naphtha and all light stocks; Cutno packing for service against caustic soda and all alkalies; Super Cutno packing for heavy acids. Glaso packing will be featured as a new product made of fiber glass yarn lubricated for service against sulfuric, nitric, hydrochloric acids, mixed acids and other heavy acids.

In addition the company will display its Favorite ratchet wrenches, and Basa rawhide-faced hammers.

Grove Regulator Company
Oakland, Calif.

Booths 1525, 1527, Annex

In attendance

M. H. GROVE
A. T. DONNELY
G. A. CLARK
B. P. FLOOD
D. B. GRESHAM
W. A. HAMMAN

Showing actual working model of one of the company's high-pressure regulators. Will have an air supply hook-up capable of delivering 2,000 pounds per square inch to show the control and accuracy of the regulators. Observers can note the extremely fine movement taking place within the regulator; in minute fractions of an inch down to 1/10,000 of an inch. The company believes this is the first time a regulator has been actually operated on such terrific pressures. In addition, there will be a special stand demonstrating the accuracy and tightness of replacement parts which permits interchange of parts in the field without removing regulators from service.

Guiberson Corporation
Dallas, Tex.

Booths 1111, 1113, 1115, Annex

In attendance

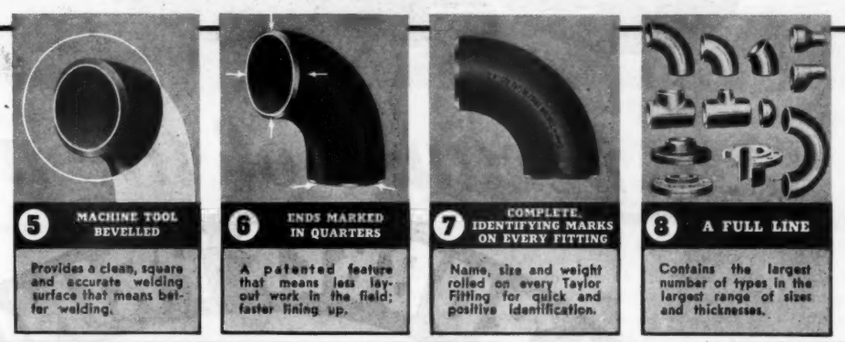
S. A. GUIBERSON, JR., chairman of the board
S. A. GUIBERSON, III, president
H. M. HASELTINE, assistant to the president
GORDON G. GUIBERSON, executive vice president and general manager
AL PRANGER, chief engineer
H. U. GARRETT, sales manager
R. G. TAYLOR, JR., service director
I. H. BUCK, pumping department sales
E. D. WILDE, gas-lift department sales
J. C. OWEN, sales representative
C. L. FORCUM, sales representative

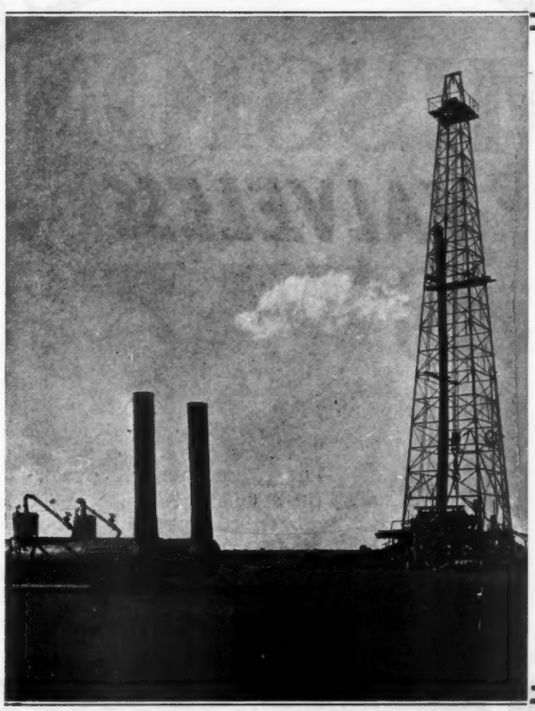
1 SEAMLESS
WeldELLS represent seamless welding fittings in their highest development.
2 UNIFORMLY FULL PIPE THICKNESS
All sections are at least full pipe thickness. There is no thinning of the back wall.
3 SELECTIVE, UNIFORM REINFORCEMENT
A typical Taylor Forge refinement based on thorough-going research.
4 TANGENTS
Removes the weld from the curved section — simplifies welding.

These features---combined in no other welding fittings---mean better pipe welding at lower cost. It *pays* to use---

TAYLOR FORGE WeldELLS Seamless Pipe Fittings for Welding

TAYLOR FORGE & PIPE WORKS, General Offices and Works: Chicago, P. O. Box 485. New York Office: 50 Church St.


5 MACHINE TOOL BEVELLED
Provides a clean, square and accurate welding surface that means better welding.
6 ENDS MARKED IN QUARTERS
A patented feature that means less layout work in the field; faster lining up.
7 COMPLETE, IDENTIFYING MARKS ON EVERY FITTING
Name, size and weight rolled on every Taylor Fitting for quick and positive identification.
8 A FULL LINE
Contains the largest number of types in the largest range of sizes and thicknesses.



Equipped with

HEAVY

STEAM ELECTRIC GASOLINE & DIESEL DRILLING RIGS

AL BUCHANAN

DRILLING COMPANY

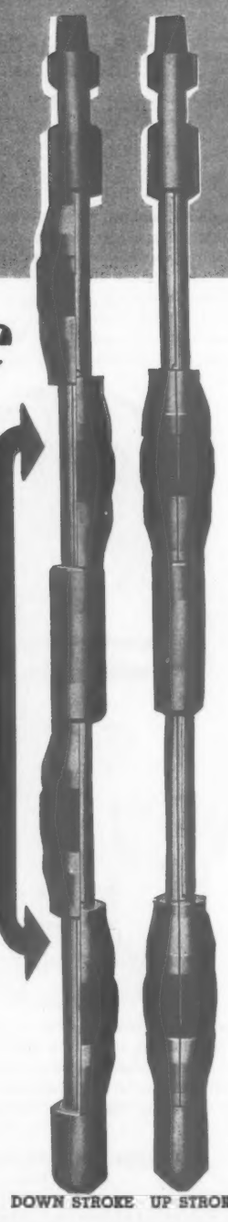
ALAMO NATIONAL BUILDING SAN ANTONIO, TEXAS

3 TIMES FASTER SWABBING WITH SAFETY

..... because of the unique

SPLIT RUBBER PRINCIPLE

MISSION *VALVELESS* SWAB



DOWN STROKE UP STROKE

WHY FASTER: The unique split-rubber principle gives unrestricted fluid passage. No ball and seat to retard the fall.

WHY SAFER: Gas pressure will open split-rubber, permitting gas to by-pass, resuming its load without loss after gas has passed. Less likely to blow swab from hole — with possible injury to men and wire lines, and serious danger from fire.

DOWN STROKE: Note that movable half of each rubber has risen above stationary half . . . allowing an area for fluid passage much larger than that of conventional type swabs.

UP STROKE: Note that movable half of each rubber has dropped back beside its other half. Rubbers now in swabbing position.

SEE DEMONSTRATION AT THE OIL-WORLD EXPOSITION, HOUSTON, APRIL 24 - 29

MISSION MANUFACTURING CO.
HUMBLE ROAD, HOUSTON, TEXAS
EXPORT OFFICE: 30 ROCKEFELLER PLAZA, NEW YORK

• SLIPS • VALVES • PISTONS • PISTON RODS • SWABS

Tools to be exhibited: P.L. rotary high-pressure pump; gas-lift equipment—flow valve and intermitter; Type "E" drilling head, rotating blowout preventer and stripper; tubing spider; casing and tubing swabs; control head packers; tubing catchers; wire line oil savers; sucker-rod strippers; high-pressure tubing oil savers; spiral packers; tubing packers; early models of swabs and tubing catchers, showing development of these tools.

The improved Guiberson Type "E" drilling head with the new lower stuffing box arrangement is extensively used to provide a packoff, capable of with-

standing high and low pressures, between the kelly, drill pipe or tubing, and the casing, in drilling wells under pressure, tubing wells under pressure, or any other application where a back pressure on the drilling fluid is required.

Gulf Engineers, Inc.
Houston, Tex.

Booths 324, 425, Main Building

In attendance

E. F. GOGGINS, president
C. A. MUNCEY, vice president
A. REINHOLD, Abegg & Reinhold Co.
DEAN LOVE, Chiksan Oil Tool Co.

Featuring the Keil shale shaker, Varco hardened and ground slush pump liners, master bushings, kelly bushings and rotary pipe slips. Chiksan all-steel rotary drilling hose, flexible swing joints in all sizes and pressures, Chiksan mud guns and "poor boy swivels."

Gulf Publishing Co.
Houston, Tex.

Spaces 624, 626, Coliseum

Gulf Tractor Equipment Co.
Houston, Tex.

Spaces 1003, 1004, 1005, 1006, Outside

Halliburton Oil Well Cementing Company
Duncan, Okla.

Booths 124, 126, 128, 130 and 225, 227, 229, 231, Coliseum

In attendance

ERLE P. HALLIBURTON H. F. CLARK
JOHN C. HALLIBURTON J. G. CREED
JAY TAYLOR A. D. STODDARD
L. D. CAMPBELL W. R. McCLENDON
C. P. PARSONS

Will display the company's line of products and equipment, featuring its electrical well logging service (HOWCO "Jeep"), and HOWCO Co-Axial Spiral. There will be on display a complete well-logging truck with side panels cut away so the public will be able to see how this device is operated in the field. The booth itself will be modernistic in design and experienced technical men will be on hand to explain the Halliburton services in detail.

Hamner-Sitton Company
Houston, Tex.

Booth 1509, Annex

In Attendance

LELAND HAMNER S. A. WOLCOTT
A. PARRISH IVAN PARRISH

Exhibiting the company's removable boiler insulation which it is stated, has been reecntly improved by using spot welding to replace bolts and wires. This facilitates removal and reapplication.

The company's new type gauge link wiper removes oil residue from the line after a tank reading and eliminates kinking and breaking of the gauge line resulting from hand wiping. The wiper directly attaches the plumb bob to the frame of the line eliminating chances of breaking the gauge line when not in use.

The company's tank suction distributor is installed on the bleed lines of storage tanks to facilitate the removal of water, basic sediment and paraffins from the bottom of the tank without allowing the oil to channel and be drained.

Harley Sales Company
Tulsa, Okla., and Houston, Tex.

Spaces 1515B, 1517, 1519

In attendance

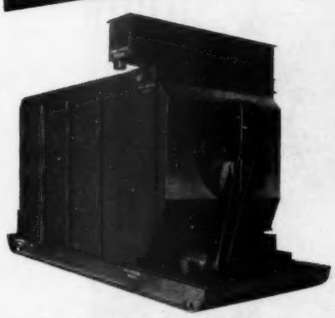
HARLEY B. NEAL ROY O. NEAL
JAMES A. MORGAN

Exhibit will include the complete line of Wisconsin air-cooled engines, complete line of air-cooled marine engines, fabricated reciprocating, rotary, and centrifugal pump units, electric light plants, compressor units.

MARLEY

The Complete Line of Water Cooling Equipment

Greater Efficiency and Economy in Water Cooling for Every Phase of the Oil and Gas Industry

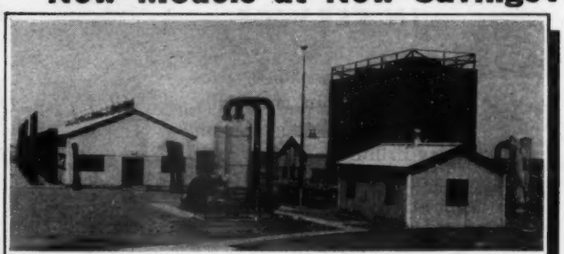


ON DRILLING AND TEMPORARY PUMPING LOCATIONS IT'S A MARLEY PORTABLE UNIT

Rapidly coming into prominence as the most efficient and economical method of cooling soft jacket-water for 300 to 800 h.p. engines which must be moved to new locations at intervals, these portable units provide many new advantages for saving operators time, trouble and money through better engine performance.

MARLEY's wide diversity of types, a few of which are shown here, permits the efficient, economical solution of any water cooling problem. It will pay you to call in your nearest Marley engineer whatever you needs may be.

New Models at New Savings!



GAS COMPRESSOR STATIONS, RECYCLING PLANTS, Etc.

Where multiple closed-system cooling services are combined in one unit, large Marley Induced-Draft Towers have proved themselves highly efficient. This tower, as an example, cools both jacket water and hot gas, each through special heat-exchange coils also manufactured by Marley.

PIPE LINE PUMPING STATIONS

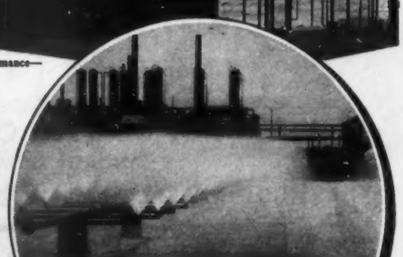
For this type of service, either open or closed system, Marley Spray and Spray-Coil Towers are in wide use.

FOR ANY LARGE HEAVY-DUTY SERVICE

Combining the advantages of flexible mechanical draft operation and the important economies of a very low water pressure requirement, the Marley Double-Suction Towers offer many valuable features for superior performance—at a new low cost.

REFINERIES, NATURAL GASOLINE PLANTS, Etc.

Where absolute dependability is necessary and heavy heat-reductions demanded together with extreme flexibility of control to meet varying operating loads and seasonal weather changes, Marley Forced-Draft Towers give valued service.



REFINERIES, STEAM CONDENSING, ETC.

Where a large capacity, heavy-duty water cooling system is required and an open area available, a spray pond is often recommended. Marley Spray Ponds are famed for higher efficiency and lower operating cost.

The MARLEY Company
Fairfax and Marley Roads, Kansas City, Kansas

Happy Belting Company
Tulsa, Okla.

Space 1022-A, outside, Bagby Avenue

In attendance

A. M. BUTCHER J. R. MEEK
A. F. NIXON

Exhibiting the company's 5-hp. double reduction Happy chain-driven pumping unit; its Young-Happy No. 36 engine jacket water cooler, and its No. 232 engine jacket water cooler for a 500-hp. engine. Also a smaller cooler.

Everything exhibited "new material" not exhibited at any other oil show. The unit and the coolers have many interesting features.

Hanlon-Waters, Inc.
Tulsa, Okla.

Booths 166, 266, Coliseum

Will display material regularly manufactured by the company, namely, oil and gas separators, bolted tanks, boomers, boiler gauge cocks, and a complete line of automatic control equipment for pressures and liquid levels. Will also have on display its new Noair-oil tank flow valve, as well as other equipment in its line which has been improved since the Tulsa exposition.

Harrisburg Engineering Co.
Houston, Tex.

Booths 1132, 1134, 1247, 1249, Annex

In attendance

J. E. SNODDY, president
C. A. LANGE, district manager
Harrisburg Steel Corp., Harrisburg, Pa.
H. B. LIGGETT, general manager
H. M. REESER, sales manager
O. C. THOMAS, sales engineer
Emsco Asbestos Co., Downey, Calif.
A. C. STEARNS, sales manager
GEORGE deBEAUMONT, sales engineer
Locomotive Finished Material Co., Atchison, Kans.
H. E. MUCHNIC, president
A. H. MOORHEAD, sales manager

Exhibiting: Harrisburg forged steel regular and "Diamond Special Alloy" slush pump liners, forged steel bull plugs, companion flanges, and pipe couplings —from raw materials to the finished product.

Emsco "Engineered" rotary brake lining sets and other types of brake lining, described as different in principle, proven in operation and which controls abrasive action, prevents scoring with excessive drum wear and delivers smooth, safe braking.

Seven and one-quarter inch by 16-inch "Universal" power slush pump, operated by small electric motor—an outstanding development in efficient pump operation.

Harnischfeger Corporation
Milwaukee, Wis.

Booth 1040, outside, Bagby and Walker Avenues

In attendance

F. SALDITT, vice president in charge of sales
G. K. WOODLING, sales manager, excavator division
R. L. SCOLLARD, sales manager, welder and electrode division
E. T. SLACKFORD, advertising and sales promotional manager
J. H. ENOCHS, district manager, Dallas, Tex.

Haynes Stellite Company
Kokomo, Ind.

Booths 109, 111, 113, 115, Coliseum

In attendance

E. E. LeVAN, vice president and general sales manager
C. W. METZGER, district sales manager, Houston
W. S. TROMLEY, district sales manager, Tulsa
F. S. BADGER, research metallurgist
R. L. LERCH, advertising manager
W. A. WISSLER, assistant manager of Union Carbide and Carbon Research Laboratories, Inc., Niagara Falls, N. Y.

Application of Haystellite cast tungsten carbide and Haynes Stellite wear-resistant hard-facing rods will be shown. Featured will be the use of products for hard-setting and hard-facing oil well-bits. How to obtain the longest possible life from rotary bits will be emphasized in this exhibit. Use of Hastelloy alloys for minimizing corrosion losses in refinery equipment handling sulfuric and hydrochloric acids will be demonstrated.

Hercules Motors Corporation
Canton, Ohio

Booths 438, 440, 539, 541, Coliseum

In attendance

A. B. WEHLING, Mid-Continent manager
JOHN C. KEPLINGER, vice president
D. W. LATTA, sales manager
R. J. SCOTT, sales engineer
FRED C. GOLDSMITH, sales engineer
RAYMOND T. LEWIS, sales engineer

Showing complete line of gasoline, natural gas and

(Continued on Page 198)

PLYMOUTH
OIL FIELD
MANILA CORDAGE "STANDS UP"
IN SERVICE

Extremes of weather, friction and strain materially shorten the life of rope on busy drilling rigs. Yet such conditions only give Plymouth Oil Field Manila Cordage a better opportunity to prove its economy in longer safe wear.

Vital to the durability of Plymouth Rope is its pure Manila fiber—only the best-adapted grades, chosen particularly for strength and toughness. Special lubrication during preparation adds effective resistance to internal and external friction. And correct construction, supervised by skilled craftsmen whose first concern is quality, produces oil field Manila Cordage on which operators everywhere rely for dependable service.

Remarkable durability, maintained by rigid *quality control* in manufacture, is a common characteristic of

PLYMOUTH MANILA

- DRILLING CABLES
- BULL ROPES
- TORPEDO LINE
- CRACKERS
- CAT HEAD LINES
- SPINNING LINES

PLYMOUTH CORDAGE COMPANY
NORTH PLYMOUTH, MASSACHUSETTS

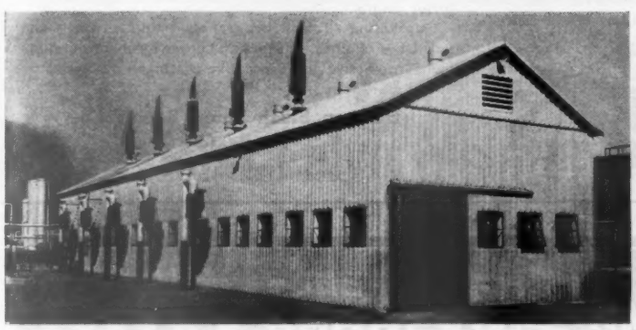
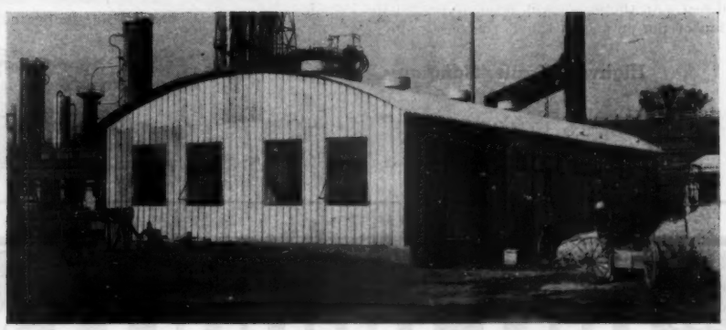
Oil Well Supply Co., Distributors—Stores in All Fields

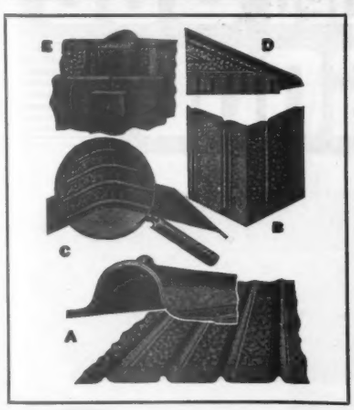
PLYMOUTH 1824 *The Rope you can Trust* PLYMOUTH 1824

BUTLER *Ready-Made* STEEL BUILDINGS

COMPLETE, READY TO ERECT QUICKLY WITH UNSKILLED LABOR

FIRE-SAFE, DURABLE, LOW IN FIRST COST, ERECTION AND MAINTENANCE



Through three decades of specialized experience in manufacturing for the oil industry, Butler engineers have developed a ready-made, section unit construction which has made Butler Steel Buildings the widely recognized standard shelter for oil industry operations.

UNIQUE AND ADVANCED SHAPING IS EMPLOYED IN THE STEEL WALL AND ROOF SHEETING OF BUTLER STEEL BUILDINGS:

Figure A—Deeply drawn panel corrugations with side shoulders multiply the strength of wall and roof sections fourfold over ordinary corrugated steel sheets.

Figure B—Shows the method of closing ends of panel corrugations at bottom and top edges of walls. Also shows how corners are formed in panel sections to eliminate corner laps.

Figure C—Roof sections are die-formed at the ridge to eliminate the need for ridge roll and to give a stronger, smoother, weather tight finish to pitch roof buildings.

Figure D—Die-forming also turns projecting eaves downward for finished appearance.

Figure E—Shows a simple method of anchoring furring strips with furring clips for carrying interior linings of commercial wall board or plaster on steel lathing.

ERECTED IN DAYS INSTEAD OF WEEKS

Detailed erection plans and instructions are supplied, which, with complete materials, systematically marked, make erection simple and possible with almost any type of labor.

FREE CATALOG SHOWS SCORES OF REFINERY, MARKETING AND OIL FIELD INSTALLATIONS

More detailed information on standard and special types, along with scores of photographs of installations, are contained in the Butler Steel Building Catalog, SENT FREE ON REQUEST. Estimates and proposals will be submitted promptly and without obligation.

All Butler Steel Buildings are carried on especially designed structural steel framework. It is fabricated in units or sections most practical for handling, shipping and quick assembly by bolting together in erection.

Stationary or ventilating type steel window sash of a large range of sizes meets any daylighting requirements.

Plain paneled or paneled and glazed swinging doors may be selected from 8 sizes. Overhead doors of the latest type, or sliding and rolling doors in all sizes, including large ones for locomotives or air transports, are fitted to any requirement.

Both the stationary and revolving types of roof ventilators are offered to provide roof ventilation for any Butler Steel Building.

SEND YOUR SPECIFICATION TODAY FOR MONEY-SAVING BUTLER QUOTATION...OR WRITE FOR FREE BUTLER CATALOG!
BUTLER
READY-MADE STEEL BUILDINGS

BUTLER MANUFACTURING COMPANY

1244 Eastern Ave. Kansas City, Mo.

944 Sixth Ave., S. E. Minneapolis, Minn.

Send FREE catalog showing ☐ Refinery ☐ Oil Field ☐ Bulk Station ☐ Boulevard Service Station installations.

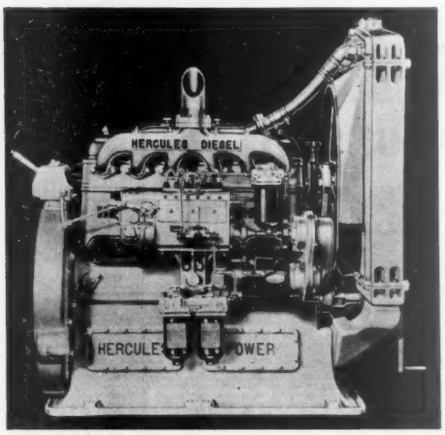
FIRM NAME .....

ADDRESS .....

CITY ..... STATE .....

Diesel power units arranged for oil field applications. A DJXC engine, mounted on a pedestal and sectioned to show the internal construction of the engine, will be on display.

Of further interest to oil men will be the special Hercules Diesel replacement package unit arranged with all the necessary mounting parts and accessories for installation in the standard Ford truck chassis, either conventional or cab-over-engine types and arranged for either right- or left-hand drive for the years 1935 to 1939, inclusive. This engine will be displayed along with the special parts which are furnished with the package in order to permit the installation of the engine in the Ford chassis.



Highway Trailer Company

Edgerton, Wis.

Space 1024-B, outside

In attendance

J. W. MENHALL, president

GEORGE C. CONNORS, chief engineer

Equipment to be exhibited is described as follows: Highway portable oil well drilling machine powered by Caterpillar Diesel engine, all mounted complete on Highway semi-trailer. Hydraulically controlled retractable rotating head. Gears and rotating parts fully enclosed in oil and mounted on heavy duty Timken bearings. Drilling speed from 40 to 150 r.p.m. in either direction. Controlled through three speed forward one reverse constant mesh transmission and reversible twin disc clutch. Drawworks consist of heavy duty winch with direct line pulling capacity of 20,000 pounds. Cable capacity, 1,550 feet of five-eighths inch steel cable. Winch speeds ranging from 150 feet per minute to 650 feet per minute. Mast, made of seamless steel tubing, 55 feet high with upper 10-foot section removable. Raised and lowered by two hydraulic cylinders. A fully portable oil well drilling machine, powerful enough to dig 3,000 feet for 7-inch casing, is light and compact enough to be transported over the highways by 1½-ton truck.

Higgins Industries, Inc.

New Orleans, La.

Booth 1062, on exposition grounds under a tent

In attendance

A. J. HIGGINS, SR., president
A. J. HIGGINS, JR., assistant vice president
E. B. HIGGINS, sales representative

The company states it has for a number of years experimented with, and believes has finally developed the ultimate article in work boats, to be used in shallow waters, and marshlands. The Eureka models exhibited are one of the smaller editions of the Eureka models manufactured by the company, and similar boats in various sizes are now being used by oil-developing companies throughout the world, and in various sizes and arrangements to fit the particular needs. In the exhibition tent, the company will show moving pictures of the various Eureka boats in operation under various conditions and the oil developers who are faced with shallow water problems should not miss this exhibit.

A. C. Horn Company of Texas

Houston, Tex.

Booth 1301

In attendance

E. M. BISHOP, president
C. E. LAMBERT, vice president
FRITZ DANIELS, New York, research chemist
JOE BRANCH, field engineer
A. L. HUNTLEY, salesman
SAM GLOVER, salesman

The company's following oil field paints and mud cleaning chemicals will be on display:

Production—Boilers and stacks: heat resisting paints. Bunkhouses and buildings: exterior and interior paints. Mechanical equipment: protective and decorative coatings, enamels and paints.

Pipe line—Tanks: paints, primers and aluminum paints. Pipe lines: protectors and black primers. Pumping stations: aluminum paints, engine and pump enamels, floor enamels, paints, etc.

Refining—Mechanical equipment: protective and decorative coatings, enamels and regular and heat resisting aluminum paints. Buildings: exterior and interior paints.

Marketing—Tank trucks, autos: paints, enamels and varnishes. Pumps, lubsters and other mechanical equipment: protective and decorative coatings.

Houston Slush Pump Repair Co.

Houston, Tex.

Spaces 1121, 1123, Annex

a HILL-HUBBELL Mill Coated-and-Wrapped Job
LOOKS GOOD and IS GOOD

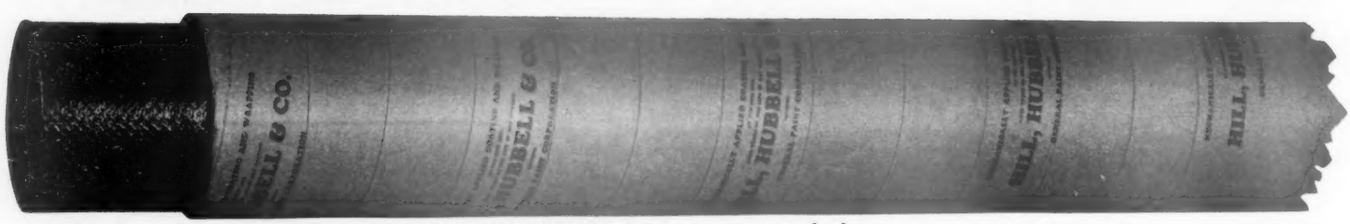


Photo of a HILL-HUBBELL Job . . . *not retouched*

Buy STEEL PIPE MILL Coated-and-Wrapped at any of these Mills

Jones & Laughlin Steel Corp.
National Tube Company
Republic Steel Corporation
Spang Chalfant, Inc.
The Youngstown Sheet & Tube Company

The job of Coating-and-Wrapping the section of STEEL PIPE shown above is a product of our marvelous mechanical age. It was Coated-and-Wrapped by the HILL-HUBBELL Process, Mechanically—INDOORS. It is not possible, by any other method, to Coat-and-Wrap miles of STEEL PIPE and give EACH foot the SAME POSITIVE PROTECTION. At the start of each job we carefully set our equipment to conform to specifications. After doing this, no matter how long the run, each foot of pipe is PROPERLY PROTECTED. With our MECHANICAL process it couldn't be otherwise. A HILL-HUBBELL Process job not only LOOKS good but is as GOOD as it looks.

A request on your letterhead will bring a copy of "PIPE PROTECTION" which describes our process in detail.

Schematic Construction of Specification TAX-1

GENERAL PAINT CORPORATION
HILL, HUBBELL & CO. • Division • Cleveland, Ohio
• EXPORT OFFICE: SAN FRANCISCO, CALIFORNIA, U. S. A. •

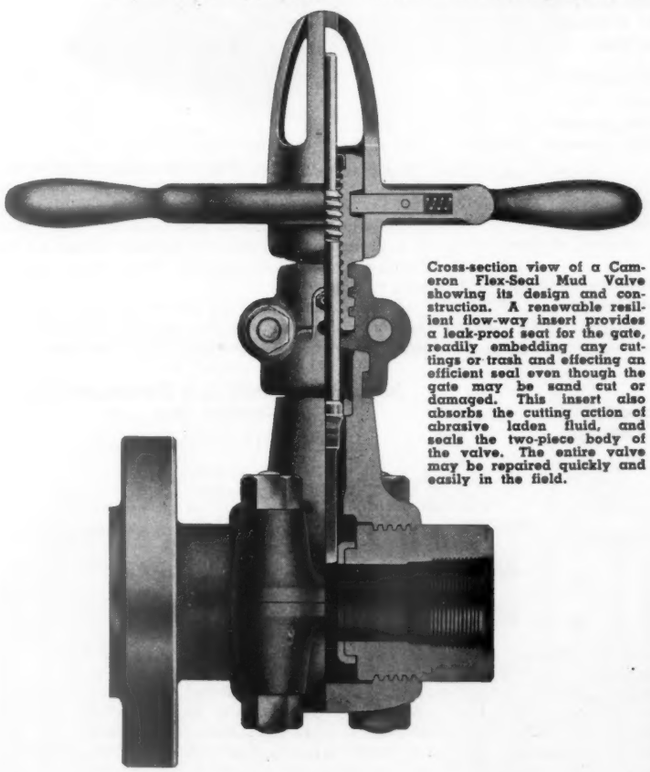
CAMERON *flex-seal* MUD VALVE

51,250

Total Maintenance — $6.70

New Valve Saves 93% Mud Valve Maintenance Cost

In a recent test of various types of mud valves on slush pump relief service in the Old Ocean Field, Brazoria County, Texas, the Cameron "Flex-Seal" Mud Valve unquestionably demonstrated its advantages over conventional type valves.



Cross-section view of a Cameron Flex-Seal Mud Valve showing its design and construction. A renewable resilient flow-way insert provides a leak-proof seat for the gate, readily embedding any cuttings or trash and effecting an efficient seal even though the gate may be sand cut or damaged. This insert also absorbs the cutting action of abrasive laden fluid, and seals the two-piece body of the valve. The entire valve may be repaired quickly and easily in the field.

A Cameron 2" Flex-Seal Mud Valve on the pump relief outlet of one rig completed five 10,250' wells, or a total of 51,250'. At the completion of the fifth well, repair costs on the valve amounted to only $6.70.

The average life of the competitive types of valves tested was one well. The average repair cost was $22.00 per well.

The results of this demonstration, which proved that the Cameron "Flex-Seal" Mud Valve can be maintained for 93% less cost than conventional types of valves, should command the interest of all who are responsible for the purchase of valve for mud manifold service. Interested operators are invited to write for an illustrated bulletin providing full mechanical details of design and construction.

Cameron "Flex-Seal" Mud Valves are available in 2", 3", and 4" sizes—6,000 lbs. test.

CAMERON IRON WORKS, INC.
711 MILBY ST., HOUSTON, TEXAS
EXPORT: 74 TRINITY PLACE, NEW YORK, N. Y.

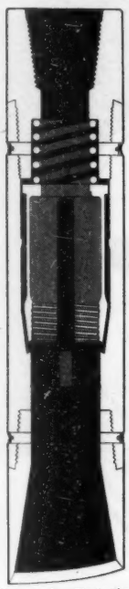
Houston Engineers, Inc.
Houston, Tex.

Booths 141-C, 141-C, on stage, Coliseum

In attendance

CHARLES R. EDWARDS, president
J. A. DORMANT, vice president
R. M. CLAYPOOL, manager
D. M. BEST, petroleum engineer

Will offer a panoramic view of all Edwards oil tools manufactured, rented, sold and serviced by this firm including the reversing tool which takes the place and does the work of a full string of left-hand drill pipe. No tool or method is more efficient or more economical for recovery of stuck or twisted-off pipe.



Type A—Rotating releasing overshot

The improved Edwards releasing rotating overshot which offers more features combined in a single tool than heretofore available. Type A, to catch tool joints or pipe by simply changing of slip. Type DB (double bowl), to catch tool joints or pipe with single tool. The ability to—release three ways—to packoff and circulate fish—to rotate fish—to jar with strain up—to spud down—to mill jagged pipe—to hold fish for inside cutting—be assembled as a unit which will not unscrew in hole are some of the features offered for these improved overshots.

A new idea in taper and box taps is shown. By combining slower tapers, multiple threads, a redesigned thread form together with the use of selected alloy steel material carefully heat-treated a greatly improved tap is achieved with such features as: larger area of contact with fish, a tap less likely to burn, requiring fewer turns to make up or break out and will transmit greater torque as well as carry a greater load in tension.

Houston Oil Field Material Co., Inc.
Houston, Texas

Booths 251, 253, 255, 257, 259, 261, 150, 152, 154, 156, 158, 160, Coliseum

In attendance

GEORGE O'LEARY — G. W. HUNT
JOE DUNCAN — A. W. WADDILL
E. H. ROBERTSON

Featuring a new 20-inch slush pump manufactured by the Wheland Co. of Chattanooga, Tenn., and an entirely new device being developed by ourselves and others for electrically logging oil wells from within the casing. Will also exhibit a complete line of oil well fishing tools.

Houston Public Library
Houston, Tex.

Space 1734

In attendance

MARTHA SCHNITZER, assistant librarian.
JOHN R. RODELL, reference assistant.

The Houston Public Library's petroleum and geological collection consists of over 3,000 volumes and 5,000 pamphlets, adequately indexed and serviced by a competent library staff. The collection includes such indispensable research aids as the publications of the U. S. Geological Survey, the U. S. Bureau of Mines, U. S. Patent Office, Texas Bureau of Economic Geology as well as basic textbooks and current monographs and periodicals.

The library's exhibit consists of selected publication lists, descriptions of the holdings, and certain rare and valuable books illustrative of the range and completeness of the book collection.

Hughes Tool Company
Houston, Tex.

Spaces 524, 526, 528, 530, 625, 627, 629, 631, Coliseum

Practically all products of the company will be on parade in a very interesting and comprehensive manner, featuring all recent improvements and developments in equipment of their manufacture—sectioned so that interior construction and workmanship may be viewed to best advantage.

An adequate staff of attendants will be present at all times to explain and demonstrate all improved features of Hughes tools. These men will include representatives of both the sales and engineering departments.

Products exhibited will include rock bits, core bits, tool joints, reamers, drill collars, valves and fittings, chokes, tubing and flow heads, complete assembled christmas trees, and other specialized oil industry tools.

Humble Oil & Refining Co.
Houston, Tex.

Spaces 5 and 7, Coliseum

It will be under the supervision of the publicity department and specialty manufacturing department.

The exhibit will feature the company's protective coatings for the oil industry, including the Rust-Ban line, Thredkote and enamels.

Hunt Tool Company
Houston, Tex.

Booths 628, 630, 632, Coliseum

Showing a new series of line valves, blow-off and cut-off valves featuring a reversible valve and seat of stainless steel. Valve and seat can be reversed or renewed without removing valve from line, and the valves can be repacked under pressure. These revolutionary line valves, manufactured according to the A.S.M.E. code, are compact, reducing space requirements to a minimum, and the design eliminates unnecessary connections.

The company's low water alarm exhibited, is a safety device to warn the fireman when the water level in the boiler is too low. The alarm is designed with an opening directly through the body and whistle valve stem, from boiler to atmosphere. A metallic fuse plug acts as a whistle valve. When the water level becomes lower than the opening to the alarm, steam replaces the water, melting the fuse plug and allowing whistle to blow until the reloading valve is closed.

Other displays will be a welded-in blade bit, wire line sheave, mud screen, and a working model of the company's wire line core barrel.

Hyatt Bearing Division (General Motors Sales Corporation)
Harrison, N. J.; Chicago; Pittsburgh, and San Francisco, Calif.

Spaces 704, 706, Coliseum

In attendance

H. K. PORTER, general sales manager
H. M. CARROLL, advertising manager, Harrison, N. J.
C. L. NEWBY, manager
F. H. WEBSTER, sales engineer
A. J. SWISLER, sales engineer
J. L. HAYNES, division engineer, Chicago divisional office
J. M. KELLY, manager, Pittsburgh divisional office
L. S. NAGLE, manager, San Francisco

Will feature the many applications of Hyatt roller bearings in drawworks, rotaries, blocks, pumping units, pumps, engines, etc.

Hydril Company
Los Angeles, Calif.

Booths 653, 655, Coliseum

In attendance

B. L. STONE, general manager
EARL M. DANIELS, sales manager
CALVIN DRAKE — C. F. WHALEY
GORDON BIRD — J. P. MAGOFFIN
MORGAN JONES, JR. — W. O. MOORE
C. E. McCARTHY — CLAUDE BANTA
GEORGE FLEMING

The company's Type "R" blowout preventer when in the open position passes all members of the drill string including the bit, since the packing unit has the same inside diameter as the casing to which the blowout preventer is attached. At the turn of the control valve, however, it is stated, the packing unit will instantly contract and effect a safe, secure closure around any member of the drill string regardless of shape or misalignment. Then, while retaining the well pressure, the pipe may be run to bottom or the kelly raised, and the string rotated while other control measures are taken. Each preventer is shop-tested to 5,000 pounds per square inch.

The company has perfected a reconditioning upset drill pipe and tool joints, known as "spiral wrap-welding." The process consists briefly of wrapping the worn upset or tool joint with an alloy steel, air-hardening and abrasive resistant spiral strip, in a machine especially designed and developed for this purpose. This strip is then welded to the upset or tool joint in an automatic welding machine using hard welding rod. The outside diameter is then turned and ground to the specified size. Where shoulders are badly worn they are built up again to nominal size and refaced.

Industrial-Scientific Supply Co.
Houston, Tex.

Booth 449

In attendance

A. J. FLEIG and R. E. CLARRIDGE, of Taylor Instrument Companies, Rochester, N. Y.; E. H. TRIPHAUS and L. G. MARSH, of Taylor Instrument Companies, Tulsa; B. H. WILSON, of Industrial-Scientific Supply Co., Fort Worth, Tex.; R. E. O'NEILL and F. W. WELLBORN, of Industrial-Scientific Supply Co., Houston, Tex.

Representing Taylor Instrument Companies, Rochester, N. Y., will have on exhibit Taylor instruments for indicating, recording and controlling temperature, pressure, flow and liquid level.

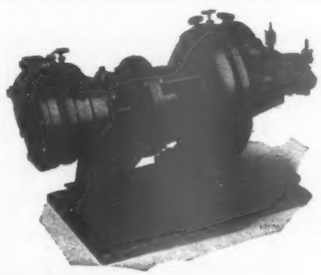
Ingersoll-Rand Company
Phillipsburg, N. J.

Space 1550, Annex

In attendance

F. W. SULTAN, JR., manager Houston office
J. J. JANZEN, New York office

Will exhibit refinery and oil field equipment. Prominent will be the "Class TRV" turbine-driven pump, introduced in 1938. A compact construction that combines both turbine and pump as one unit on a common shaft is the outstanding feature of its design. The pump is built in single-stage sizes for capacities from 5 to 1,000 gallons per minute against heads as high as 220 feet, and in two stage sizes for capacities to 275 gallons per minute and heads up to 600 feet. It is particularly suitable for refinery service in the presence of hazardous gases by virtue of the type of drive it employs.



Additional equipment to be exhibited includes the combustion system of the Type "S" oil engine, and details of the "XVG" gas-engine-driven compressor.

International Derrick & Equipment Co.
Columbus, Ohio

Exhibit 1047, Walker Avenue

In attendance

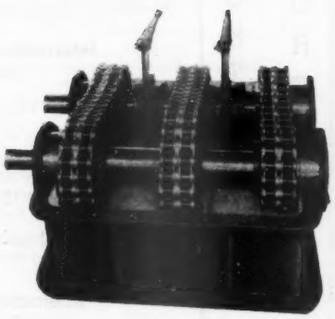
L. J. BROWN, president — C. R. ATHY
J. M. AITKEN — H. F. SHEPHERD
R. R. BLOSS — W. H. CUMBERLAND
C. G. BOOKER — E. H. EDDLEMAN
L. L. POWELL — J. A. TIDBALL

An entirely new design of IDECO unit pumper will be shown embodying many worthwhile improvements. Prominent among these is the use of needle-type beam bearings, an exclusive IDECO feature. All beam bearings are needle-type roller bearings and are self-aligning. They are totally enclosed and perfectly sealed. These bearings are pressure lubricated from the samson post. Each pumper is equipped with the new IDECO wheel-type counterbalance. The design of this counterbalance permits easy and safe adjustment and gives the utmost in precision balancing. Wrist pins are equipped with self-aligning double Timken

Even up the Load!

WITH A **GUMBO BUSTER ROTARY DRIVE TRANSMISSION**

Utilize the full horsepower of both engines to reduce repair bills and add to drilling profits!



Manufactured by
The American Well & Prospecting Company, Corsicana, Texas

The mechanical rig which uses one engine while drilling to drive the Slush Pump and the other to drive the Rotary, permits the Draw Works engine to "loaf" most of the time, while the Slush Pump engine takes the load—**and the heavy repair bills.**

Engines on this type of Rig may be compounded for greater power and efficiency. By utilizing a Gumbo Buster Rotary Drive Transmission ample power is then available—with both engines operating at their most economical and efficient speeds—for obtaining maximum Slush Pump volume and pressure, while Table rotation is regulated by the three-speed Transmission.

Compounding lengthens the life of both engines, reduces engine repair costs and adds to the efficiency and drilling capacity of the Rig by permitting the use of greater engine power for maximum fluid volume and pressure through the Slush Pump, without overloading or overworking either engine.

The moderately priced Gumbo Buster Transmission may be added to any Rig using a conventional Draw Works which does not provide multiple speeds to the Rotary, by simply bolting it in place on the derrick floor or Draw Work skids. **No welding, cutting or shop work is necessary.**

For full particulars phone, wire or write any Bridgeport Store, Office or Field Representative.

Distributed by

BRIDGEPORT

THE BRIDGEPORT MACHINE CO. Factory and General Offices, Wichita, Kan.

HOUSTON • DALLAS • SAN ANTONIO • CORPUS CHRISTI • ODESSA • FORT WORTH • SHREVEPORT • TULSA
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bearings, self-aligning in seal enclosed housings.

IDECO will also display the following equipment

manufactured in its Beaumont plant: IDECO 4M portable rotary drilling rig; IDECO 17¼-inch Oilbath rotary; IDECO traveling and crown blocks.

International Harvester Company

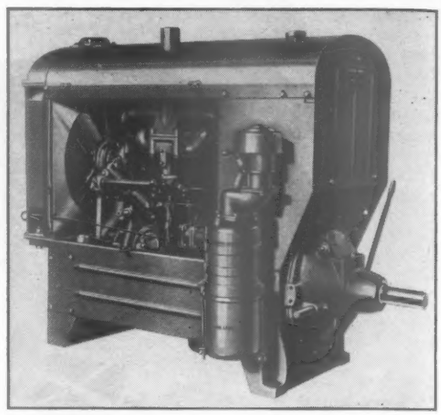
Chicago, Ill.

Spaces 1034 and 1036, outside

In attendance

L. M. McWHIRTER, manager, Houston, Tex.
W. F. McAFEE, sales manager, Chicago.
P. V. MOULDER, manager, motor truck sales, Chicago.
NEAL HIGGINS, industrial equipment sales.
R. E. BUTLER, manager, Southwest district, Chicago.
Branch managers:
J. J. FOLEY, Dallas.
J. M. RYAN, San Antonio.
B. N. ROBERTS, Sweetwater.
R. W. ELLIOT, Tulsa.
R. E. JAQUIER, Oklahoma City.

Displaying motor trucks, tractors, and power units especially equipped for oil-field work. A feature will be the new Model TD-18 full Diesel six-cylinder Trac-TracTor. With a maximum belt horsepower of approximately 80 and a drawbar horsepower of 70, the TD-18 becomes the largest in the International crawler tractor line, which now consists of three Diesel models and three gasoline models. Among the latter on display, will be TD-40 and TD-35 Diesel TracTracTors



equipped with winches, pipe booms, and other oil-field equipment.

Among the International motor trucks to be shown will be the big six-cylinder Model AR-626-F six-wheeler with rated capacity of from 10 to 15 tons; the 1½- to 2-ton Model DS-35 with two-speed rear axle; and the Model ½-ton D-2 pick-up. Typical oil-field equipment will be mounted.

Seven of the power unit models will be displayed, including new Model U-10. Special displays will include cut-out motor truck and Diesel engines, Tocco-hardened crankshaft display, and magneto display. The International industrial wheel-tractor line will be represented by Model I-14.

International Nickel Co., Inc.

New York, N. Y.

Spaces 602, 700, 701, Coliseum

In attendance

A. G. ZIMA, development and research division; B. B. MORTON, development and research division; F. R. BAILEY, monel and rolled nickel department; G. W. STRAHAN, nickel sales department.

Exhibiting nickel alloy steels, nickel cast irons, nickel bronzes, Ni-Resist, Ni-Hard.

International-Stacey Corp.

Columbus, Ohio

Space 1047, Outside

Jarecki Manufacturing Co.

Houston, Tex.

Booth 746, Coliseum

In attendance

J. F. EATON — B. B. CURRY
ED S. RANKIN — N. G. BLANKENSHIP

Displaying a variety of Jarecki valves and fittings, including brass, malleable, and gray iron pipe fittings; brass and iron body gates valves. Will also display several Jarecki oil well specialties.

The Jacobs Wind Electric Company

Minneapolis, Minn.

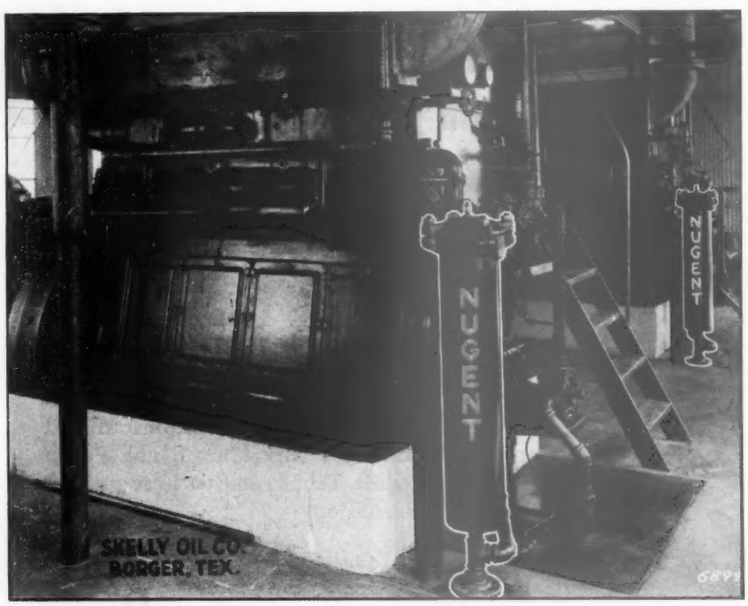
Spaces 1558, 1560, Annex

In attendance

M. L. JACOBS, general manager

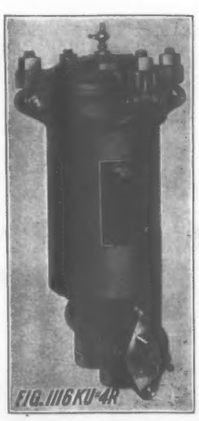
The company announces it has developed a new special engine for the cathodic protection of pipe lines. It is designed to run continuously, year after year, supplying electricity to the pipe lines to prevent their corrosion, due to electrolysis. It has no valves, gears, belts, pumps or any working parts other than the crankshaft, connecting rod and pistons. This design, the company states, means the elimination of most of the maintenance and depreciation expense common with conventional engines. It requires inspection only four times a year. It has a special condenser on the radiator to prevent evaporation of cooling liquid and a special reserve oil reservoir that automatically maintains the proper oil level in the crankcase without the use of oil pumps or circulating units. Its two-cylinder design eliminates vibration. Its extra large

NUGENT OIL FILTERS
PROTECT ENGINES IN BORGER TEXAS DUST BOWL AREA



Filtering All of the Oil Circulated to the Bearings and Cylinders Every Cycle through these Nugent Large Area (Patented) Lubricating Oil Filters removes the Dust, Bearing-wear, and Carbon as soon as they get into the oil, thus checking the formation of sludge and acidity.

The filtering material is an especially woven Lintless, Acid resisting, textile material which removes particles as small as .0004". There is 20 times more filtering surface than in most filters.



SPECIFY NUGENT FUEL AND LUBRICATING OIL FILTERS FOR YOUR DIESEL ENGINES.

Built in 8 sizes from 1 to 130 G.P.M.

Send for bulletin 7A

NUGENT TRADE MARK

Wm. W. Nugent & Co., Inc. Mfrs.

Oil Filters, Oiling and Filtering Systems, Telescopic Oilers, Oiling Devices, Sight Feed Valves, Flow Indicators, Compression Union Fittings, Oil Pumps, Etc.

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That's what they say of the man who reads authoritative oil books as well as The Oil and Gas Journal. For he is the man who knows, the man who can get things done. And he is keen enough to realize that money spent for the right books is a direct investment in future success.

Want to follow his example? Then you can't start more wisely than by selecting your books from this list of reliable texts:

ACCOUNTING FOR THE PETROLEUM INDUSTRY.
By Morland and McKee $4.00

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By Bell $6.00

ANALYTICAL PRINCIPLES OF THE PRODUCTION OF OIL, GAS, AND WATER FROM WELLS.
By Herold $7.50

CHEMICAL GUIDEBOOK $2.00

ELEMENTS OF FRACTIONAL DISTILLATION.
By Robinson $3.00

ELEMENTS OF GEOPHYSICS.
By Ambronn $5.00

FIELD GEOLOGY.
By Lahee $5.00

GENERAL ENGINEERING HANDBOOK.
By O'Rourke $4.00

GEOLOGY OF PETROLEUM.
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GEOPHYSICAL PROSPECTING.
American Institute of Mining and Metallurgical Engineers $5.00

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HYDROGENATION.
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By Osgood $10.00

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By Ver Wiebe $6.00

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By Porter $3.00

PETROLEUM IN UNITED STATES AND POSSESSIONS.
By Arnold and Kemnitzer $6.00

PRACTICAL OIL GEOLOGY.
By Hager $4.00

PRACTICE OF LUBRICATION.
By Thomsen $6.00

PYROLYSIS OF CARBON COMPOUNDS.
By Hurd $9.50

SCIENTIFIC PRINCIPLES OF PETROLEUM TECHNOLOGY.
By Gurwitsch $9.00

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BOOK DEPARTMENT

THE OIL AND GAS JOURNAL

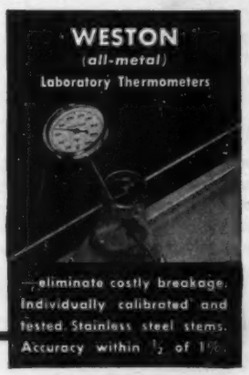
Tulsa, Oklahoma

with ALL that ALL-METAL means

Except for the scale glass, every part of the WESTON Industrial Temperature Gauge is made of metal . . . even the vital temperature element. That's why these thermometers "stand up" in service . . . *they possess the sturdiness which all-metal construction provides*. In addition, they provide these other outstanding advantages:

- **Accuracy guaranteed within 1% full scale**
- **Large, readable gauge-type scales**
- **Corrosion-resisting stainless steel stems**

Be sure you get complete information on these readable and rugged money-saving thermometers. Send for booklet today. Weston Electrical Instrument Corp., 673 Frelinghuysen Ave., Newark, N. J.


WESTON
(all-metal)
Laboratory Thermometers
—eliminate costly breakage. Individually calibrated and tested. Stainless steel stems. Accuracy within

WESTON

INDUSTRIAL TEMPERATURE GAUGES

"On Duty or in Competition . . . Fearless as the Dragon."

For Dutiful Performance Depend on Dragon . . .

Since 1912, Dragon Valve and Pump Cups have proved most dependable where dependability counts most—*out there on the job!*

For Deep Wells

They are "tailor-made" by cup builders who specialize in their *one* job—building cups to deliver *extra*-long service.

Toughest materials, especially processed to meet rigid tests, Dragon Cups—*Composition, Nobs* and *Leather*—Surely take *an over-dose of punishment,* while saving *your* profits, time and nerves.

Specify "Dragon", *every time.*

The Dragon Mfg. Co. Marietta, Ohio.

For Shallow Wells

What Makes A Success Story?

Isn't it the determination to excel and better previous marks—the conviction never to be satisfied with a complacent "good enough?"

That's how we feel about it. It's the way we explain our constant vigil to keep O'Bannon Products the highest in quality and service—to make each one of them a "success story."

Take valve cups, for example. They all look pretty much alike, but there must be some reason why men who try O'Bannon Cups come back for more—and tell us they get better runs.

It IS hard to explain. We can mention that O'Bannon Cups are absolutely uniform, accurate in all dimensions, and made of the finest materials—but you can convince yourself so much more conclusively by just using a few.

The next time you buy some, won't you ask for O'BANNON CUPS?

•

Made in Ft. Worth by

WALTER O'BANNON COMPANY

TULSA FORT WORTH

crankshaft carried on Timken bearings, running at very slow speed, insures practically permanent continuous operation with almost no wear or need of attention. It is designed to operate from natural gas or gasoline on oil lines. It is rated at 6 hp. and can supply current over a range of 5 to 40 volts, with a capacity up to 100 amperes. It has been in development for two years and it is now going into production.

Janney Cylinder Company

Philadelphia, Pa.

Booths 409-411

In attendance

ROBERT O. AYRES, Ayres Engineering Co.

CHARLES R. SPARE, vice president, Janney Cylinder Co.

New or improved products shown:

Improved Diesel engine liners, with 16-inch honed bores by 60 inches long, of centrifugally cast Pressure-tite iron.

New Supard-chrome steel pump liners, hardened to 500 plus Brinell, with honed bores and ground outside diameters, acid and abrasion resisting.

Ground shaft sleeves for centrifugal pumps of Supard-chrome steel, 500 plus Brinell, and Worthite—acid resisting steel.

Hot oil pump plunger of Supard-chrome steel, 500 plus Brinell, acid and abrasion resisting—easy on the packing.

Pump liners of centrifugally cast Pressure-tite iron; of Ferrodur iron, and of Ni-Resist iron.

Shaft sleeves for centrifugal pumps of Supard-chrome steel, 500 plus Brinell; and of Worthite; hot oil pump plungers of Supard-chrome steel; Nickeldur bronze—acid resisting; Tightensile bronze pump liners, sleeves and bushings; monel metal pump liners, sleeves and bushings; stainless steel cylinders (27 per cent chrome) (18-8), (12-14 per cent chrome, etc.).

Jeffrey Manufacturing Company

Columbus, Ohio

Booths 659-661, Coliseum

In attendance

N. E. SALSICH, vice president and general sales manager

C. R. HELLER, vice president in charge conveyor sales

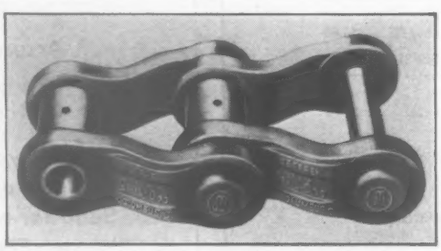
L. E. BRILL, products sales manager

T. P. BURKE, district manager, Houston

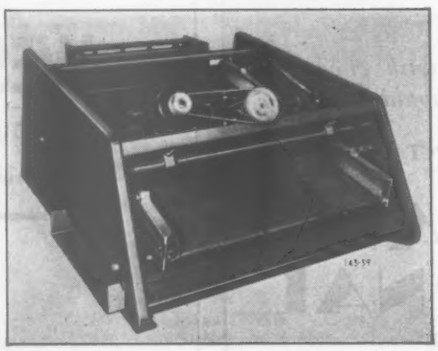
H. F. ADRIAN, salesman

Products to be exhibited: Oil well chains; mud screens (shale shakers); feeders (electric vibrating).

Jeffrey oil well chains bearing the trade-names of



Devil Dog, Rotor Chief, and Ranger are, it is stated, precision built from the finest alloy steel adaptable to chain construction, conforming in every respect



with A.P.I. dimensional standards. Sidebars are offset giving resilience to absorb shock. Offset construction facilitates coupling and permits removal or replacement of links. It is added the mirror-like finish of bearing surfaces eliminates initial stretch.

New type of shale-shaker having a uniform predetermined straight line motion over entire deck. Amplitude of vibration, it is stated, cannot be altered by heavy or light load; it is solidly built of heavy steel and proved under actual working conditions. Screening and conveying are equally efficient; entire screen deck is alive over any and all spots. It has a leak-proof mud outlet constructed like a drawer. A one-half horsepower motor is sufficient.

The company is also showing a Traylor "Waytrol," precision weighing machine, consists of: all electric vibrating feeder; a synchronous weigh belt on a scale beam pivoted to receive material at the most sensitive end; automatic all electrical control. Feeding and weighing are physically separated processes, making, it is said, for accuracy and ease of remote control.

These dustless "Waytrols" are suited for proportioning automatically materials such as clay, filtrol, fullers earth, lime, and cement. They may be controlled by pressure, temperature, or current demands of accessory equipment.

Jenkins Bros.

New York, N. Y.

Booths 233, 235, Annex

In attendance

H. J. BARNSLEY, assistant chief engineer

W. BOYCE WHITE, sales representative

F. J. KLEMANN, sales representative

Featuring the increase in its facilities of service to the oil industry in the South. The company opened a warehouse last June in Houston, Tex., stocking a complete line of Jenkins valves particularly applicable to oil field and refinery equipment. This insures 24-hour delivery of products to the entire industry.

New Jenkins products at the exposition include a complete line of stainless steel valves and the new and improved U-Bolt gate valve.

M. O. Johnston Oil Field Service Corporation

Los Angeles, Calif.

Booths 1125, 1127, Annex

In attendance

M. O. JOHNSTON W. F. BETTIS

T. A. ANDREW

Exhibiting motion pictures of testing tool, Vibro-Jar and refacing machine operations.

Glass model well and model testing tool.

Model of jar, derrick and rotary table.

Full sized refacing machine.

The S. M. Jones Company

Toledo, Ohio, and Tulsa, Okla.

Booths 1239, 1241, Annex

In attendance

P. C. JONES, president

H. K. BROWNING, sales manager

D. R. DALE, chief engineer

D. O. JOHNSON, manager, field engineering department

L. J. PUNDT, division manager

C. E. BUCHNER, district representative

Many interesting things connected with sucker-rods will be featured in mural-montages in the booths. The field engineering department is shown collecting the

facts in the field through well studies. The research work in the laboratory is illustrated, through which

See THE ENTIRE UNIBOLT LINE ON EXHIBIT AT THE HOUSTON OIL SHOW

THORNHILL-CRAVER COMPANY, INC. ★ HOUSTON, TEXAS

PERFECT GRIP
DROP FORGED STEEL
RED U-BOLT
HOT GALVANIZED
for MAXIMUM SAFETY
FASTEN YOUR WIRE LINES With Genuine
CROSBY
WIRE LINE CLIPS
Insist on the Red U-Bolt. None can show it but the Genuine.
There is a CROSBY CLIP Dealer near you with all sizes in stock. Ask us for his name.
AMERICAN HOIST & DERRICK CO.
CHICAGO ST. PAUL, MINN. NEW YORK

GET LUFKIN FOR UTILITY
Oilmen! No matter what pattern Tape or Rule you prefer, there's an accurate, sturdy and durable Lufkin to suit your needs. The "Mezurall" Tape-Rule and "Red End" Rule here shown are but two of the many top-notch favorites in the extensive line of Lufkin Measuring Devices.
See Lufkin pages in Petroleum Register and Composite Catalog.
Write for free complete catalog No. 12.
NEW YORK THE LUFKIN RULE CO SAGINAW, MICHIGAN WINDSOR ONT
TAPES — RULES — PRECISION TOOLS

the use of new steels is developed, and added strength and ductility are given to sucker-rod materials. Other murals show how these facts, collected from field and laboratory, are used to manufacture better sucker-rods that fit the various pumping conditions. Also pictured will be the subject of product service, showing how facts about care and handling of sucker-rods are utilized for better field practices.

The center mural shows the motion picture crew making the talking picture, "Progress in Sucker-Rods." Here Rodney, the hitchhiker, who crashed the movies in Oklahoma, in order to show how not to handle sucker-rods, is getting instructions from the motion picture director, just before one of the scenes is shot. This talking picture will be exhibited in the Auditorium during the Exposition.

Jones & Laughlin Steel Corporation
Pittsburgh, Pa.

Booths 649-651

In attendance

L. M. PARSONS, vice president; V. A. JEVON, assistant to vice president; W. H. WIEWEL, assistant general sales manager; J. O'H. ANDERSON, sales manager—tube division; A. P. HOLLOWAY, tube department; JAMES G. WATSON, field representative; H. P. QUINN, field representative; N. R. PUTNAM, field representative; W. C. JAMIESON, field representative; A. H. QUAY, metallurgical department; H. L. SUMMERS, chief inspector—tube division; H. N. KEENER, development engineer—tube division; H. E. FISHER, superintendent—tube division; A. E. CROCKETT, manager—bureau of instruction; R. M. GIBBS, manager of advertising; F. D. WINSLOW, district sales manager—Houston; W. R. K. SCOTT, field representative; GEORGE E. TYSON, field representative; DAVID GHENT, field representative; JAMES T. BATCHELOR, Houston office; BAIRD TEWKSBURY, JR., Houston office.

Featuring the corporation's complete line of tubular products for the petroleum industry, along with the products of its new Gilmore wire rope division.

The Joyce-Cridland Co.
Dayton, Ohio

Spaces 408, 410, Main Building

In attendance

HUSTON BROWN, vice president; HARRY B. BURLOW, district sales manager.

Will display its complete line of mechanical and hydraulic jacks for oil field service. Featured will be the No. 2028 Joyce 20-ton automatic lowering rig builders jack; the Joyce 25-, 35- and 50-ton ball-bearing geared screw jacks for skidding derricks and general service; the Joyce No. 78 15-ton emergency jack for trucks and setting boilers; the Joyce 25-, 30- and 50-ton journal jacks for refinery shops and field service; and the Joyce 50-, 75- and 100-ton self-lowering jacks for pulling casing and handling heavy equipment.

Of special interest will be the Joyce BJ2 hydraulic bumper jack for automobile service—and the complete line of the Joyce Liftmaster hydraulic jacks from 1½ to 30 tons capacity, for trucks and derrick service.

Keasbey & Mattison Company
Ambler, Pa.

Spaces 1235, 1237, Annex

In attendance

WILLIAM C. SCOTT, vice president
WILLIAM S. ACUFF, JR., sales manager
H. W. DAVIS, manager, Houston district

Exhibit will feature high- and low-pressure pipe and block insulation, asbestos corrugated sheets as siding for industrial construction, asbestos millboard for use as fireproof lining in ceilings, and partitions and also for use as gaskets or discs, spiral, sheet and rod packings for use against hot or cold oils, and asbestos paper. Will also exhibit "Century" asbestos-cement pipe for the conveyance of water under pressure.

Kenffel & Esser Co.
Hoboken, N. J.

Booth 1139, Annex

In attendance

A. D. TASKER, sales representative

Exhibit will be devoted entirely to the showing of Wyteface steel tapes for the oil industry. A large portion of the display will be devoted to the new Dallas Wyteface "A" gauging tape with raised metal graduations and numbers on a crack-proof white background, designed to resist abrasion.

Kibele Manufacturing Company
Dallas, Tex.

Booth 1100, Annex

In attendance

ERIC G. SCHROEDER JAMES WILSON
JOHN W. YERGER

Equipment shown includes tubing catchers, packers, swabs, boiler feed pump pistons and rod stripper. One of the featured tools will be the new Kibele valve-in-head packer which is meeting increased favor in connection with gas- and air-lift methods. No slips are used on this packer and it therefore cannot wedge in the casing. A piston valve in the head can be locked either open or closed. Cups automatically seal tightly the instant the valve is closed and fluid or gas pressure is transmitted to them.

One of the latest Kibele tools to be shown is the improved rod stripper. It permits backing off rubber packings when rods are being run down the well, thus preventing excessive wear. When stripping action is desired the packings are again shoved into place. This stripper is made of steel, is light and easily assembled.

Two-step and three-step Kibele tubing catchers, another feature, with their great slip areas, are designed and built to minimize the pressure put on casing walls when tubing is either accidentally dropped or when it is anchored in a well.

Kibele hot water type pistons, a catchall to stop all objects accidentally dropped down a well, a tubing check valve and a special release valve for use with Reda pumps will be other new Kibele products that will be shown.

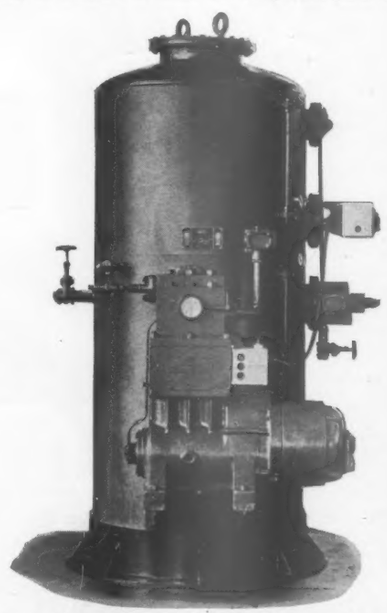
Kobe, Incorporated
Los Angeles, Calif., and New York, N. Y.

Booths 1418 and 1420, Annex

In attendance

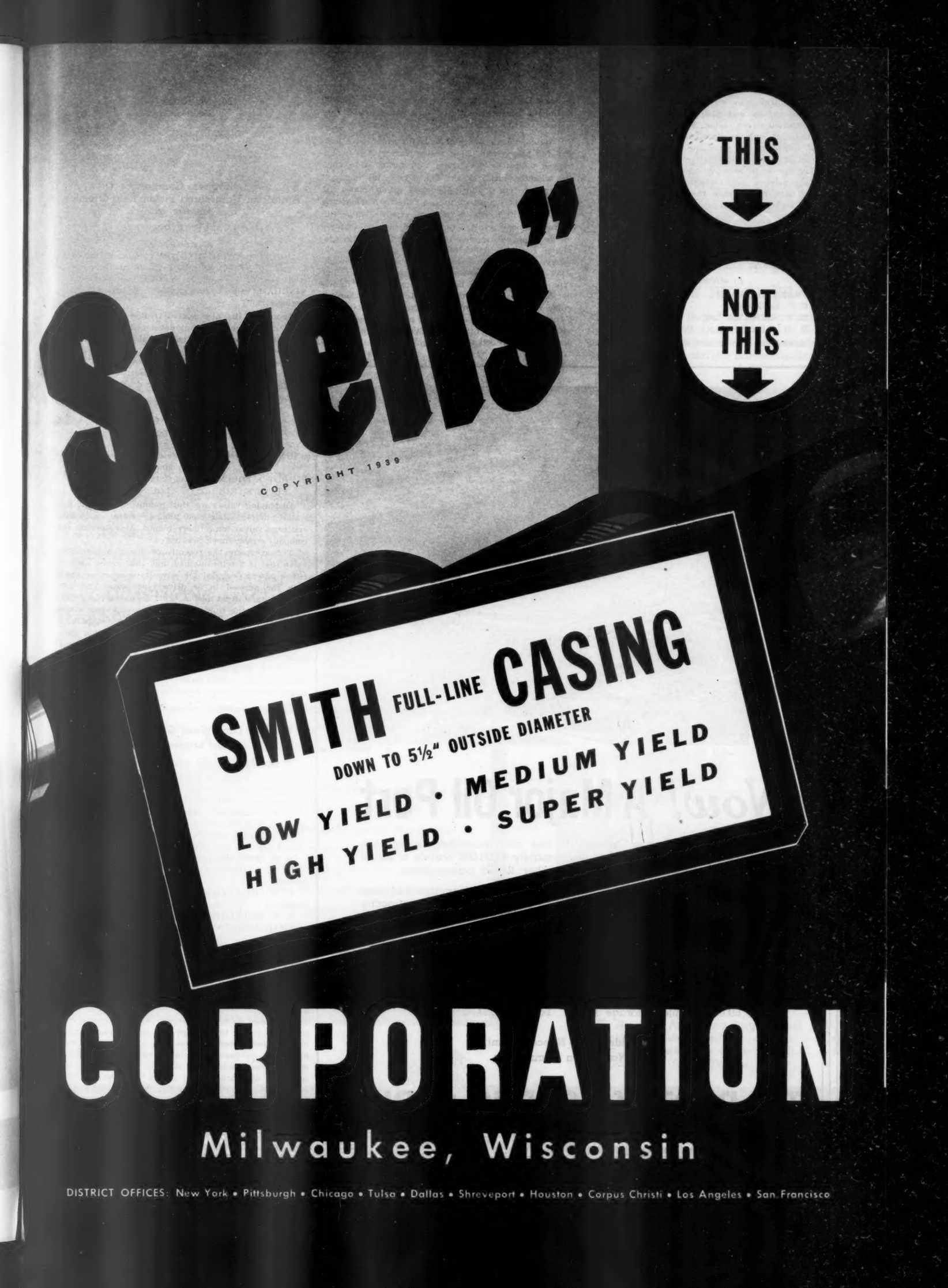
C. J. COBERLY C. M. RADER
R. G. RALPH B. M. MORONEY
M. L. WALRAVEN, JR.

Visitors to the booths will be extended an opportunity to examine in detail the component parts of a



Kobe hydraulic all-purpose pump. This display and demonstration of the units, according to the manufacturer, will show that the Kobe pump, a complete fluid-operated oil-well pumping unit, comprises all the necessary equipment required to produce oil efficiently and economically from wells of any capacity and depth, under all field, well and operating conditions. A number of charts, illustrations and records of performance under a wide range of operating conditions, also will be available to those who are interested in getting detailed data on these subjects.

(Continued on Page 210)


Swells"
COPYRIGHT 1939
THIS
NOT THIS
SMITH FULL-LINE CASING
DOWN TO 5½" OUTSIDE DIAMETER
LOW YIELD • MEDIUM YIELD
HIGH YIELD • SUPER YIELD
CORPORATION
Milwaukee, Wisconsin
DISTRICT OFFICES: New York • Pittsburgh • Chicago • Tulsa • Dallas • Shreveport • Houston • Corpus Christi • Los Angeles • San Francisco

The company also will have on display samples with cross sections and other illustrative examples of its heat-treated screen casing. Representatives will explain in detail, with the aid of these exhibits, the process of slotting Kobe pipe; the advantages of Kobe undercut slots for producing wells; microphotographs showing the depth to which the metal is refined by the Kobe process; load deflecting curves made from bending tests; and a large volume of additional data that will be of interest to production men.

Kinzbach Tool Company, Inc.
Houston, Tex.

Booths 355, 357, Coliseum

In attendance

FRANK KINZBACH — R. B. KINZBACH
C. F. KINZBACH — E. B. SCHULZ
C. W. EICHBAUM, JR. — E. C. ROPER
H. M. WHEELER — V. L. RAYFORD

Exhibiting its regular line of whipstocks, milling tools and Kinzbach-Ajax slips along with the Bowen overshots, spears, linewipers, circulating heads, rope sockets and the following new equipment:

The company's series of tools for progressive milling for heavy wall alloy casing comprising an improved whipstock, a starting mill arranged to open the window quickly at the top, a new finishing mill designed to cut a short pipe core which guides the mill along the whipstock until a full-length window is completed; the Kinzbach-Ajax unit type drill pipe slip of four-segment construction embodying the features of the company's regular two-piece drill pipe slip providing for interchangeable inserts, fluid drainback, safety, economy and ease of handling; the Kinzbach-Ajax tubing slip and bowl with a four-segment unit type slip arranged to handle several sizes of tubing by changing inserts; the new Kinzbach sucker-rod guide attached in the middle of the rod by a positive U-bolt so it cannot slip after being made up; the Bowen safety joint which utilizes a novel principle of load distribution through the breakout connection.

Now! A Major Oil Port

Last year the Corpus Christi-Port Aransas Waterway handled 81,428,590 barrels of crude and refined petroleum products. The Waterway has taken its place as one of the nation's major oil ports, with facilities capable of meeting the most exacting demands.

The Port is the terminus of 24 pipe lines bringing crude oil to tidewater from 153 fields — all within five minutes to three hours ride of this rapidly growing city of 60,000 people. Storage facilities can accommodate approximately 8,000,000 barrels of oil, or other liquid commodities.

Corpus Christi proper has four oil docks with a loading capacity of 10,000 barrels per hour each. Private docks increase the loading capacity appreciably.

Manufacturers and distributors of oil field and oil well supplies should investigate Corpus Christi. It IS the oil capital of the South Texas empire.

Address the Nueces County Navigation Commission

The PORT of CORPUS CHRISTI

M. M. Kinley Co.
Houston, Tex.

Space 537, Coliseum

In attendance

M. M. KINLEY — O. V. BORDEN

Koppers Company
American Hammered Piston Ring Division
Baltimore, Md.

Booths 204, 206, 208

In attendance

JOHN A. WORTHINGTON, manager industrial sales; E. S. FREEMAN, JR., assistant manager, industrial sales; J. M. FULLER, sales engineer; W. P. CUNNINGHAM, sales engineer; BART ALDRIDGE, sales engineer.

Featuring the new surface-treated type of piston ring which is a treatment developed by one of the major oil companies that enables piston rings to seat quickly and reduces the possibilities of scoring or scuffing taking place in the cylinders.

Also exhibiting the Gold Seal inserted type of ring and the new and improved scraper drain and oilcutter oil control rings.

L-K Pump Valve Company
Houston, Tex.

Space 1236, Annex

In attendance

ROY J. LOUCKS — W. G. (BILL) SANDERS
CECIL E. KIRK — LOUIS H. KENNON

Displaying valves for slush pumps, oil pumps, salt water pumps, boiler feed pumps, cementing pumps, and cage valves for refinery pumps. Also showing the company's new Inner Seal valve.

This company has recently developed a cage type valve that is a self-contained unit and can be used in either pumps designed for screw type seats, or those with the pressed in or drive type seats. The new grooved type fluid piston will be on display, four types of bakelite fluid piston rings, compressor rings; both segmental and one-piece, as well as rod packing and oil wiper rings; four types of ball bearing spinning line swivels, including two types recently developed, one of which weighs only 2¼ pounds and has a breaking strength of over 15,000 pounds. The company will also exhibit rubber cementing plugs, tubing plugs, pressure gauge protectors and line of bakelite products.

Lane-Wells Company
Los Angeles, Calif.

Booths 364, 366 and 465, Coliseum

In attendance

RODNEY S. DURKEE, executive vice president
NORMAN L. DORN, chief engineer
E. M. ANDERSON, engineer
M. E. MONTROSE, Gulf Coast division manager
M. T. HIGGS, Gulf Coast division sales manager
J. E. HUFF, JR., sales engineer
G. E. THOMPSON, Houston district superintendent
C. F. LUDWIG, Corpus Christi district superintendent
H. W. HILLEBRANDT, Shreveport district superintendent
R. B. McCULLAR, Mid-Continent division manager
CHARLES T. CASEBEER, Mid-Continent sales manager

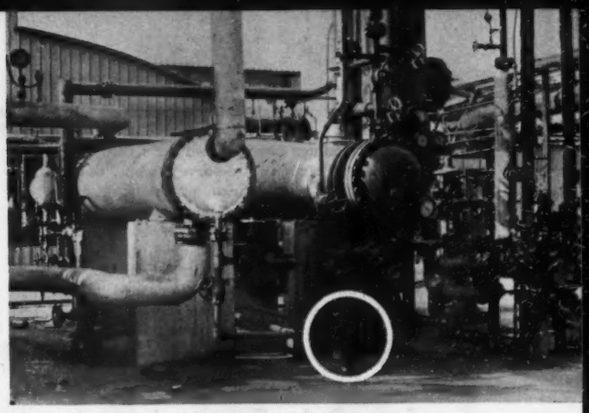
Lane-Wells Electrolog service now being introduced into Mid-Continent and Gulf Coast areas is an advanced electrical open-hole logging service providing Multicurve records of formation. Maximum detail on three or more curves with faster operations is one of the chief features.

Developed in California and perfected during the past two years, the service will be introduced with new, improved electrical recording apparatus, accurate measuring equipment and improved electrodes. Multicurve records reflect the extreme sensitivity of the recording apparatus which makes interpretation and correlation of formation easier, and can be readily compared with similar records.

Complete motion pictures of Lane-Wells operating technique will be shown at the company exhibit during the exposition.

To meet demands for survey equipment to cover a wider range of oil field application Lane-Wells introduced the Model "C" multiple-shot survey instru-

Dependable Performance!



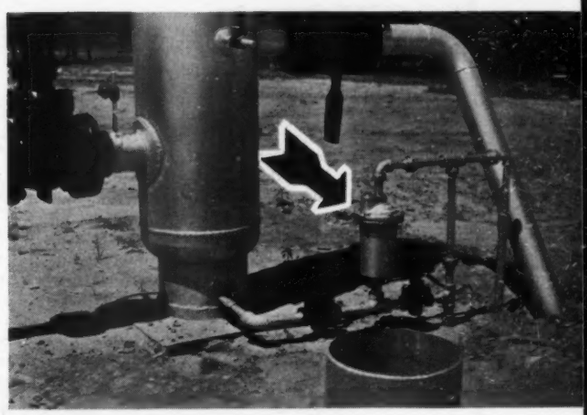
POLY PLANT REBOILER

THIS Armstrong forged steel trap drains condensate out of the steam coils of a Braun reboiler on depropanizer and debutanizer columns of a UOP catalytic polymerization plant.

WHEN you put in Armstrong Traps, you know that you are installing the best that money can buy, and time has proved that they are the lowest cost traps in the long run. We will be glad to give you the facts on how much this low maintenance expense has meant in representative refineries.

Recently, there has been an increasing trend among oil companies to standardize on Armstrong Forged Steel Traps, even for low pressure service. These traps feature stainless steel buckets and valve mechanisms, and are very moderately priced on a basis of capacity offered. We invite you to examine samples of these traps in our booth, No. 1564, at the Houston Oil-World Exposition. *We will also be glad to mail you descriptive literature.* ARMSTRONG MACHINE WORKS, 868 Maple St., Three Rivers, Michigan.

STOCKS carried by Geo. B. Allan & Co., Dallas, Houston, Tulsa, Oklahoma City; Louisiana Steam Equipment Co., New Orleans; O'Brien Equipment Co., St. Louis; Hughes Machinery Co., Kansas City, Mo.; Guy L. Warden, Los Angeles.



GAS SCRUBBER

HERE is a typical application of an Armstrong trap to automatically remove fluids accumulating in a gas scrubber. This installation is at the Rodessa, La., compressor station of the United Gas Public Service Co.

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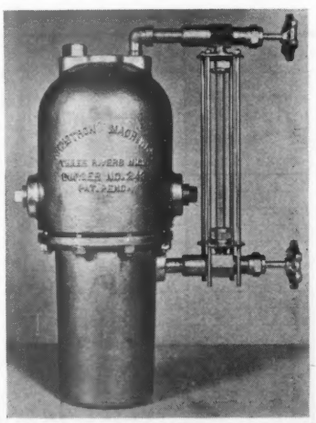
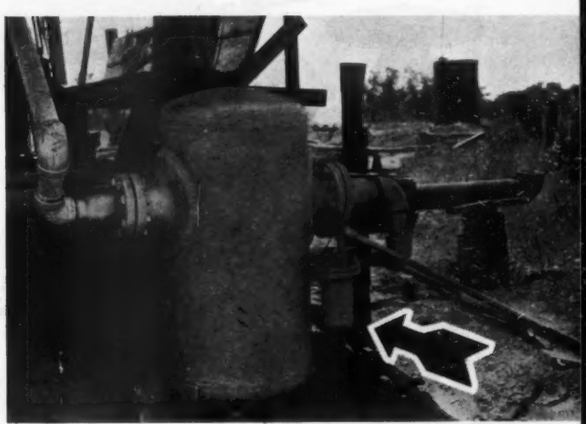


THE device shown at the left is a brand new development of the Armstrong Machine Works. It is a combination Air Purger and High Side Float Valve for compression type refrigerating machines. It helps to cut power costs by reducing condenser pressure. SEE IT IN OUR BOOTH AT THE HOUSTON OIL-WORLD EXPOSITION.



DRILLING RIG SEPARATOR

THE No. 313 Armstrong forged steel trap is the standard size used by drillers to drain steam separators. This one is on a B. G. Byers Oil Co. rig at Talco, Texas.

ARMSTRONG TRAPS

Automatic Drainage for

REFINERIES · GAS PIPE LINES · DRILLING RIGS

ment. Measurement units cover any inclination likely to be encountered by use of two plumbobs. Compass and inclination readings are recorded on a film which has large enough capacity to survey wells of any known depth with a wide margin of safety. Pictures are precisely read for rapid, accurate computation. Can be run on sand line or drill pipe in open hole for magnetic survey or oriented on drill pipe or tubing in cased hole. Survey speeds are from 1,000 to 4,000 feet per hour. Instrument is reloaded in the field with no need for dark room. Clocks are compensated to hold within one second per hour over a temperature range of 50° F. to 250° F. O.D. is 3¾ inches.

Larkin Packer Company, Inc.

St. Louis, Mo.

Booths 308, 310, Coliseum

In attendance

J. J. LARKIN, SR., St. Louis, Mo.
W. H. LARKIN, St. Louis, Mo.
J. J. LARKIN JR., St. Louis, Mo.
C. F. DOUGHERTY, Tulsa
C. H. WATSON, Houston, Tex.
T. E. ALEXANDER, Corpus Christi, Tex.
R. W. JOHNSON, Corpus Christi, Tex.
J. J. DAILEY, Kilgore, Tex.
J. H. BARNARD, Shreveport, La.
W. G. SEIS, New Iberia, La.

Feature various types of Larkin float equipment, including guide shoes, float collars and float shoes. Several new items added during the past year will be displayed, among them the company's new ball and seat type float shoe and float collars, as well as its whirler type guide shoes, and Larkin seamless swage nipples, bull plugs and casing nipples. All nipples and plugs have perfect threads beveled for easy starting —ends faced square—inside edges chamfered—and uniform in length, shape and outline. Then too, each nipple and plug is labeled showing size and thread.

Larkin casing shoes, spiders, clamps and packers will also be on exhibit. Within the past few months the company has introduced a new tubing head which will also be displayed.

Layne and Bowler Company

Houston, Tex.

Spaces 344, 346

In attendance

L. D. MICKLEY
W. V. WALTERS
H. C. BLOCK
W. W. WALTERS

Featuring a sectional view of a gravel-packed well showing how the gravel surrounds the screen in a well, acting as an additional screen for the fluid.

Another novel feature of the exhibit will be two 7-foot photographs of as many different settings with gravel packing. This method of completing or reworking a well is rapidly increasing in favor throughout the Gulf Coast. It is stated it effectively eliminates sanding up, reduces sand cutting troubles, reduces reworking jobs on the well and creates new economies and efficiencies of production.

In addition to the gravel-pack process, the company will display its wire-wrapped screens as well as its packers.

Lebanon Steel Foundry

Lebanon, Pa.

Spaces 1419, 1421

In attendance

W. H. WORRILOW, president
A. J. McDONALD, vice president—sales
P. E. GERHARD, sales engineer
W. B. SULLIAN, sales department
C. H. FOLWELL, JR., Texas representative

Will have on exhibit: Regulating valve parts, gas meter parts, gate and globe valve bodies of various descriptions, pump casings, as well as other pump parts; flow line headers and return bends for stills; pipe line couplings, drill bits, casing slips, etc., made from either the company's regular Circle L normal carbon steel, Circle L-10, a 5 per cent chromium steel with .50 molybdenum; circle L-5, a chromium-nickel-molybdenum steel.

Leeds & Northrup Company

Philadelphia, Pa.

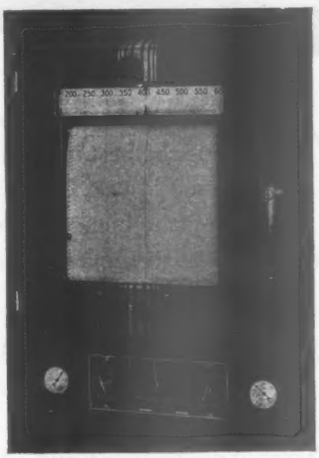
Booth 329, Coliseum

In attendance

R. E. HANSEN, Houston; W. W. STREEVER, Houston; M. E. GRIFFITH, Tulsa; G. C. GRAF, Philadelphia, market extension division; G. W. TALL, JR., Philadelphia, industrial sales manager.

Exhibit consists of three operating equipments of particular interest to the oil field:

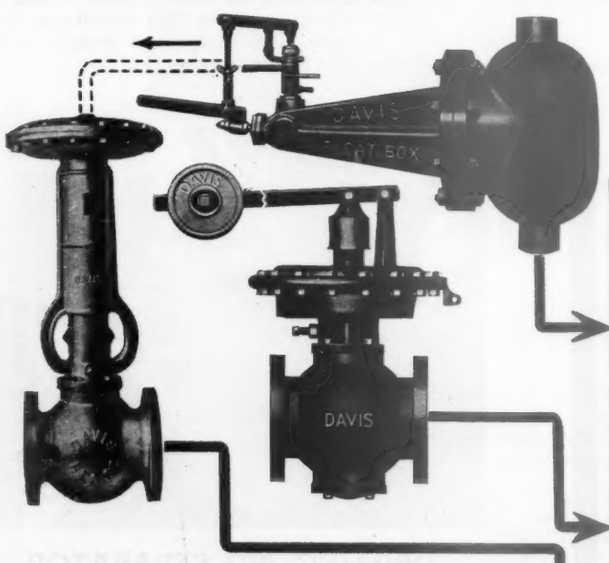
An operating display shows the importance of auto-



matic standardization to accurate temperature measurement and control. By automatically maintaining the standard in Micromax at full accuracy, even the "too-small-to-be-seen" motions of the instrument's micro-responsive mechanism take on new value.

Micromax pneumatic control is in actual operation

A COMPLETE LINE of Pressure, Flow, and Level Controls *for Air, Gas, Water and Oil!*



IF YOU are responsible for the selection and purchase of automatic control equipment, we believe the chart at the right will be of considerable interest to you. Note that these are all standard items which means prompt delivery . . . tried and tested performance . . . modern design . . . and maximum economy. We believe it will pay you to check with Davis on any automatic valve need. Ask for catalog.

DAVIS REGULATOR CO.
2543 S. Washtenaw Ave.,
CHICAGO, ILLINOIS

YOU CAN FIND IT HERE — Standard DAVIS Products	Built to following pressure standards: 125 lbs.	250 lbs.	400 lbs.	600 lbs.	1500 lbs.	Materials: Body: Bronze	Semi-steel	Cast Steel	Trim: Bronze	Nickel Iron	Monel	Stainless Steel	Range of standard sizes:	Service: Steam	Air	Gas	Water	Oil
CONTROLLERS, Liquid Level	X	X	X				X	X	X			X	6", 8", 10" Floats				X	X
GOVERNORS, Pump	X	X	X			X	X	X	X		X	X	½" to 4"	X				
REGULATORS, Boiler Fuel Line	X	X	X			X	X	X	X	X	X	X	½" to 6"			X		X
Damper	X	X					X		X				3" or 4" x 12"	X				
Flow	X						X		X				10" to 24"	X				
Pressure	X	X	X	X	X	X	X	X	X	X	X	X	½" to 14"	X	X	X	X	X
STRAINERS, Pressure Line	X	X	X	X	X	X	X	X	X	X	X	X	½" to 12"	X	X	X	X	X
Suction Line	X						X		X			X	⅜" to 14"				X	X
TRAPS, Air	X	X					X		X				¾"		X			
Condensate	X	X	X				X	X	X		X	X	2" to 6"	X				
Steam	X						X		X			X	½" to 3"	X				
VALVES, Altitude	X	X	X				X	X	X		X	X	2" to 14"				X	
Back Pressure	X						X		X				2" to 24"	X		X		
Balanced	X	X	X	X		X	X	X	X	X	X	X	½" to 24"	X			X	X
Butterfly	X					X	X	X	X			X	3" to 24"	X			X	X
Check, Balanced	X	X	X	X			X	X	X			X	6" to 24"	X		X		
Check, Cushioned	X	X	X				X	X	X			X	2" to 12"	X			X	X
Diaphragm Motor	X	X	X	X		X	X	X	X	X	X	X	½" to 14"	X	X	X	X	X
Exhaust Relief	X						X		X				6" to 48"	X				
Float	X					X	X		X	X			½" to 12"				X	
Fluid Control	X	X				X	X		X	X			½" to 12"				X	X
Lever Operated	X	X	X	X		X	X	X	X			X	¾" to 24"	X	X	X	X	X
Low Water Fuel Cut Out	X	X	X				X	X	X			X	¾" to 4"					X
Motor Operated	X	X				X	X		X				½" to 10"	X	X	X	X	X
Pilot	X	X	X			X	X	X	X		X	X	½" to 2"	X	X	X	X	X
Relief	X	X	X				X	X	X			X	½" to 16"	X	X	X		
Relief, Balanced	X	X				X	X		X		X	X	½" to 14"	X		X		
Relief, Comb. Pres. & Vac.	X						X			X			2" to 8"			X		
Solenoid Operated	X	X	X	X	X	X	X	X	X	X	X	X	½" to 12"	X	X	X	X	X
Stop and Check	X	X	X	X	X		X	X	X			X	2" to 14"	X			X	
Trip, Emergency	X	X	X				X	X	X	X		X	½" to 14"	X		X		X
Turbine Non-return	X	X	X				X	X				X	4" to 24"	X				
Vacuum Breaker	X						X	X	X				2" to 12"		X	X	X	X

~~STANDARD~~ *Seamless*

DRILL PIPE

Is always readily available. Equipped with any make of Tool Joints.

Immediate shipment of any of the following types can now be made from stock:

- ***National Recess Weld***
- ***Hughes Counter Bore Weld***
- ***Reed Shrink-Grip***
- ***Hydril***
- ***Shrink Thread***

AT THE HOUSTON OIL SHOW
SPANG CHALFANT WILL EXHIBIT IN
BOOTHS 144, 146, 245 and 247
DROP IN AND SEE US

SPANG CHALFANT, INC.

GENERAL OFFICES: GRANT BUILDING, PITTSBURGH, PA.

SALES OFFICES: BOSTON NEW YORK PHILADELPHIA PITTSBURGH ATLANTA
CHICAGO ST. LOUIS TULSA HOUSTON DENVER SAN FRANCISCO LOS ANGELES

to show how the correct relation is maintained between temperature, load, control point and valve position.

Micromax multiple-point recorder shows fast temperature recording of six thermocouples, each printed in a different color.

Le Roi Company
Milwaukee, Wis.

Booth 1046, outside

In attendance

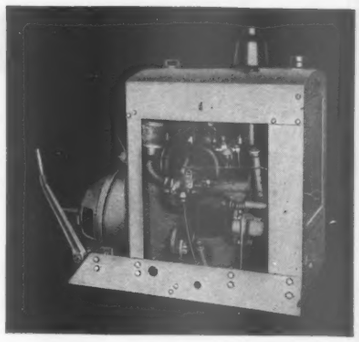
Le Roi Co.:

C. W. PENDOCK, president
W. R. KARLL, general sales manager
L. G. VALDES, Tulsa branch manager
R. A. PRIDE
B. F. KOEPKE

(Houston dealer personnel (Southern Engine & Pump Co.):

D. N. WOMMACK — W. G. PRICE
H. H. McGILVARY — RICHARD KROPP
LINN K. PARK — WALTER A. PRICE

Will exhibit two of its five sizes of heavy-duty drilling engines, four of its seven models of pumping engines, and two 110-volt d.c. light plants. Shown for the first time will be two sizes of pumping engines devoted especially for shallow field work. Of particular interest is the power take-off which consists of a heavy-duty Twin Disc oil-field type clutch, a generously sized alloy steel drive shaft and an extra large bell housing, enclosing a flywheel nearly twice as heavy as those used on other engines of comparable size—an important factor in the unusually smooth operation of these engines. Also being shown for the first time is a weatherproof, 5 kw., 1,150 r.p.m., 110 volt d.c. light plant. The switchboard and instruments are built into a panel conveniently located at the rear of the machine. All instruments and electrical fittings are completely weatherproof and the entire unit is fully enclosed and mounted on a steel skid to facilitate handling.



7-11 h.p. Le Roi pumping engine

WHY
ASKANIA
GRAVITYMETERS?

FIVE GOOD REASONS

1. **High measuring accuracy:** probable error plus or minus 0.06 mgl.
2. **Speed of operation:** time per set-up: 4 minutes.
3. **Suitability for long distance measurements:** over several hundred miles.
4. **Large direct range of measurements:** over 1600 mgl. covering nearly the whole area of the U.S.A.
5. **Small tilt error:** 90 seconds tilt in two horizontal directions equal 0.1 mgl.

WRITE US
for further details.

ASKANIA

AMERICAN ASKANIA CORPORATION
826 M. & M. BUILDING, HOUSTON, TEXAS

Lehigh Safety Shoe Company
Allentown, Pa.

Booth 1575A

In attendance

ARTHUR SULLIVAN — C. M. MENSE

Exhibit will consist of a complete showing of new, full Neoprene "Oil Fighter" boots and shoes designed to combat toe hazards and corrosive under-foot conditions prevalent in many phases of the oil industry. In addition, there will be a full showing of Lehigh Safety footwear with leather, rubber, and cord-in-rubber soles and heels, designed for every industrial need.

We will Design a Special

REGULATOR

FULTON High-Pressure
REGULATOR

C-F Regulators of standard design meet all requirements in the control of pressures up to 600 pounds. Chaplin-Fulton engineers will design a special regulator capable of controlling the highest pressures carried on any line, and adapted to the conditions of the particular installation, passing on to the main or distribution system such pressures as may be desired. Chaplin-Fulton Regulators have been used with satisfaction for over fifty years.

Write for Catalog.

The CHAPLIN-FULTON MFG. CO.

28-40 PENN AVE. CF PITTSBURGH, PA.

R. G. Le Tourneau, Inc.
Peoria, Ill., and Stockton, Calif.

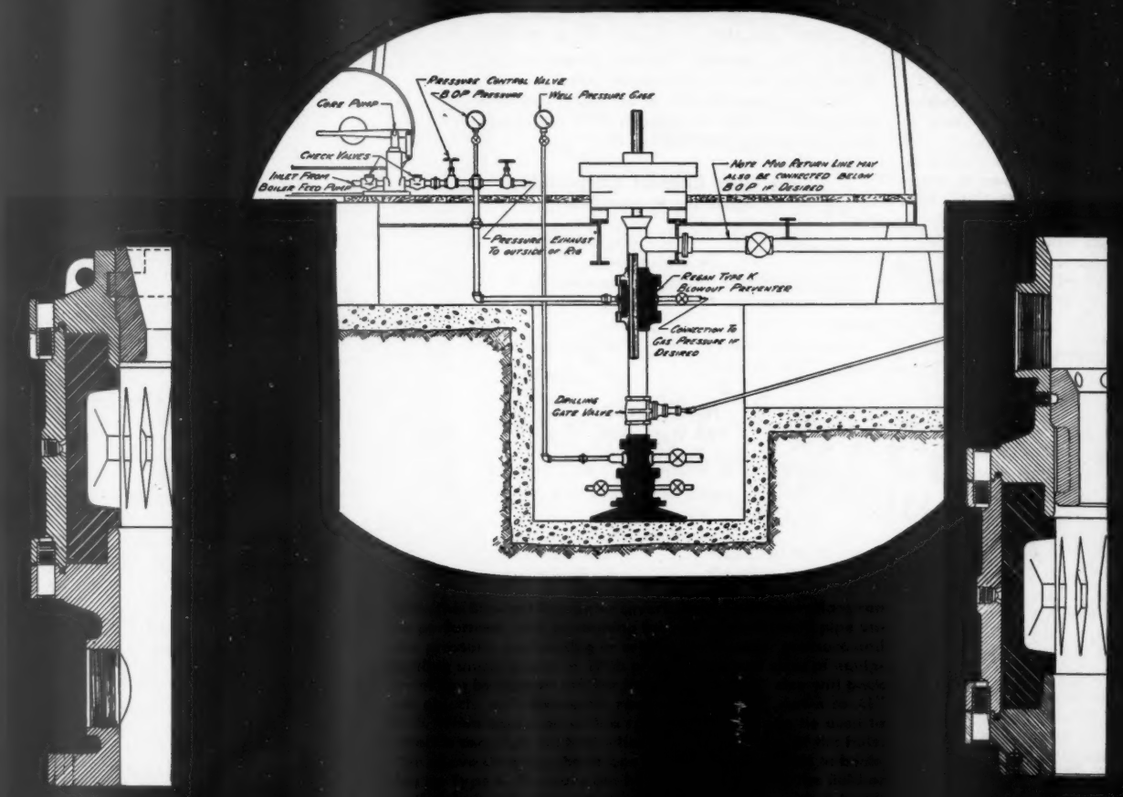
Spaces 1003, 1004, 1005, Outside, and Gulf Tractor Equipment Co. Section

In attendance

J. K. HARPER, district representative
GEORGE SUMMERS, export sales supervisor
DENN M. BURGESS, general manager
E. R. GALVIN, sales manager

Will display three of its machines, angledozer, bulldozer, and tractor crane. The angledozer is designed to give an extra margin of usefulness by angling the blade 30 degrees right or left for side casting dozed material and by tilting either corner for side-hill work. The company states its angledozers and bulldozers feature fractional inch blade control for ideal surface finishing; instantaneous, powerful, dynamic high-blade lift and low drop that quickly and conveniently handle the high diking and stubborn clearing; close mounting of the frame to retain the normal tractor balance and give sure-footed traction; self-sharpening, reversible blades set at a plow-like angle for natural digging

REGAN TYPE K BLOWOUT PREVENTER


Pressure Control Valve
BOP Pressure
Well Pressure Gage
Gage Pump
Check Valves
Inlet From Boiler Feed Pump
Note Mud Return Line may also be connected below BOP if Desired
Pressure Exhaust To outside of Rig
Regan Type K Blowout Preventer
Connection To Gas Pressure if Desired
Drilling Gate Valve

Mid-Continent Office
1502 Maury St., Houston

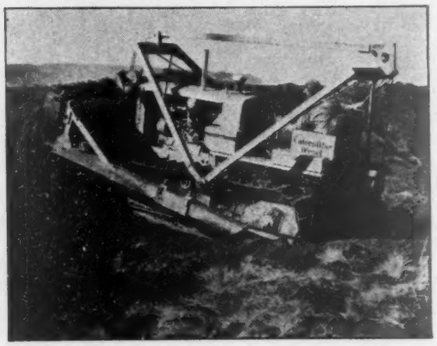
New York — 17 Battery
G. R. Woods, Rep.

Regan
Forge & Engineering Co.
San Pedro California

Quality — Wrought on the Forge of Experience

Oklahoma and Kansas
Representatives
Bovaird Supply Co.
Tulsa and Wichita

suction; bowls curved to roll loads instead of pushing deadweight; and box beam, arc welded construction throughout for the greatest strength and least weight.



The mobile, powerful two-wheeled Le Tourneau tractor crane is said to be ideally suited for handling heavy, awkward loads in inconvenient places.

A. Leschen & Sons Rope Co.
St. Louis, Mo.

Booths 1231, 1233-A, Annex

In attendance

L. E. DRESSLER — L. W. WEYLER
E. E. LAMBERT

Displaying complete line of wire rope samples, which will include the numerous constructions in which the company's "Hercules" (Red-Strand) wire rope is supplied for the various oil field purposes. These samples will consist of a wide range of round strand and flattened strand constructions—in both standard and preformed types.

Experienced wire rope men will be in attendance to discuss any wire rope problem.

Three types of Leschen rotary lines. Samples of these and other Leschen oil field lines will be exhibited.

The Lincoln Electric Co.
Cleveland, Ohio

Spaces 735, 737, 739, 741, Coliseum

In attendance

A. F. DAVIS, vice president, Lincoln Electric Co.

B. K. SMITH, president, Big Three Welding & Equipment Co., Houston, joint exhibitor

Latest equipment and developments in arc welding will be the feature of the exhibits. The exhibit of arc-welding equipment will include a Diesel engine driven arc-welder and latest models of stationary and portable motor driven "Shield Arc S.A.E." arc welders which recently introduced self-indicating dual continuous control. This method of arc welding current control will be demonstrated, together with the welding of various metals.

The demonstrations will include welding with recently developed electrodes: "Fleetweld 8" for high speed single pass fillet welding, "Fleetweld 9" for fast production of butt welds in heavy plate, "Chromeweld 4-6" for 4 to 6 chrome steels, "Transweld" and "Ready-weld" for use with small transformer type arc welders, and several new surfacing electrodes. Other Lincoln electrodes which make it possible to arc weld any metal used to any extent industrially, will be included in the electrode display. Latest developments in arc-welding accessories and supplies, as well as "Linc-Weld" motors will also be shown.

Linde Air Products Co.
New York

Spaces 109, 111, 113, 115, Coliseum

In attendance

C. G. JAX — C. E. BOYDSTON
W. G. SPEER — J. M. DULANEY
G. C. ESCHENBURG — R. F. ARNOLDY

Featuring uses of the oxy-acetylene process in oil-field operations. The company will exthibit together with Haynes Stellite Co. and National Carbon Co., Inc., the three companies being units of Union Carbide & Carbon Corp. The display will show, with actual demonstrations, shape-cutting with oxy-acetylene cutting machines, and the welding of oil well casings. On display also will be a pipe-cutting machine and other oxy-acetylene welding and cutting equipment, and flame-hardening apparatus.

Line Scale Co.
Oklahoma City, Okla.

Spaces 1230, 1232, Annex

Link-Belt Company
Chicago, Ill.

Booths 416, 418, 420, Coliseum

In attendance

FRED WALLACE — BOB HORTON
E. G. WENDELL — GEORGE HOWSON
STUART PENICK — C. W. SPAULDING
C. R. WEISS — H. L. STRUBE

A Link-Belt mud reconditioning screen will be exhibited in operation. There will be samples of Hyper, Red-Hed and Silverlink oil well drilling drive chains, and a liberal assortment of antifriction roller bearings. A brilliantly illuminated back wall will illustrate typical drive chain and mud screen installations. Talkative black-faced Amos will again be on hand.

A. M. Lockett & Co., Ltd.
Houston, Dallas and New Orleans

Representing Worthington Pump & Machinery Corp.

Booths 1327, 1329, Annex

In attendance

F. D. RAHM — J. E. MONTGOMERY
E. J. SALAUN — F. J. ELLIS

F. J. Ellis, manager oil field production division, Worthington Pump & Machinery Corp.

Exhibiting general line of horizontal duplex power pumps for oil field use together with centrifugal motor- or engine-driven pumping unit.

Lone Star Cement Corporation
Dallas and Houston, Tex.

Spaces 1563, 1565, Annex

In attendance

J. B. ROBERTS, research engineer; J. E. MIFFLIN, sales engineer; W. W. (DICK) SIMPSON, sales engineer.

Exhibiting cements for oil well uses—Lone Star, "Incor," and "Starcor."

Jon R. Long
Fort Worth, Tex.

Spaces 164, Coliseum, 1402, Annex

Shared jointly by Kyner Long Corp., and Jon R. Long.

Manufacturer

In attendance

R. R. KYNER — CLYDE KYLE
BILL WRIGHT — E. B. RAINEY
ERNEST GOLDSCHMIDT — JON LONG

Kyner Long Corp. will show a complete line of differential type gas lift flow valves, intermitters, flow controls and well controls, chokes and gas lift fittings.

Jon R. Long, manufacturer, will show a complete line of pumping equipment—balls and seats, drops and seats, standing valves, traveling valves, working barrels, insert pumps, check valves, polished rods, polished rod clamps, valve pullers, sucker rod sockets, sucker rod subs, polished rod stuffing boxes, wire line stuffing boxes, back sidecrank units, stroke posts wrist pins, etc.

Lucey Boiler & Mfg. Corp.
Chattanooga, Tenn.

Booth 1067-A, outside

In attendance

W. S. BASSETT, manufacturer's representative

Exhibiting Lucey 150-hp. 350-pound W.P., 96-inch all welded firebox oil county boiler.

Lufkin Foundry & Machine Company
Lufkin, Tex.

Space 1066-C, outside

In attendance

W. C. TROUT — W. W. TROUT
A. B. BENNETT — L. A. LITTLE
DON KERR

Exhibiting two popular units, TC-3-18A and TC-55-7A. TC-3-18A is a single reduction herringbone gear unit rated at 27 horsepower with a maximum stroke of 54 inches and 17,000 pounds polish rod load. TC-55-7A is a new, small, economical yet substantial unit for shallow production. This unit, designed after the larger Lufkin units, is, it is stated, made of the same high-quality materials and meets all of the rigid requirements as regards workmanship, etc., exemplified in all other Lufkin products. It is popular in the Illinois fields, having a maximum stroke of 42 inches and polish rod load of 8,000 pounds.

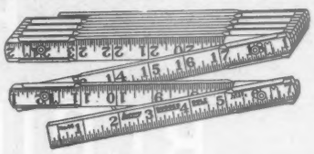
The Lufkin Rule Co.
Saginaw, Mich.

Booths 3, 4, main entrance, Coliseum

In attendance

R. M. BENJAMIN — E. H. MEIBEYER
D. W. MACOMBER

Displaying company's complete line of measuring instruments, including measuring tapes, both steel and



woven, rules of wood, steel and aluminum, of practically all descriptions, and a complete line of precision tools, such as micrometers, calipers, combination squares, gauges, etc.

The Lunkenheimer Co.
Cincinnati, Ohio

Booths 214, 216

In attendance

HARRY A. BURDORF, sales manager
MARSHALL N. STICKELL, sales representative
JOSEPH A. BIRKHEAD, sales representative
ELMER R. TIEBERMAN, sales representative
JOSEPH WALDECK, sales representative
D. R. DAVIS, sales representative
E. P. LUNKEN, sales representative

Exhibit will consist of bronze, iron, steel and corrosion resistant alloy valves, lubricating devices, cocks, etc., for use in the petroleum industry. Sectioned models of many of the valves will be shown.

McCullough Tool Company
Houston, Tex., and Los Angeles, Calif.

Booths 1546, 1548, Annex

In attendance

O. J. McCULLOUGH — I. J. McCULLOUGH
E. S. MORROW — H. W. HARRISON

Exhibiting gun perforators, wire line operated; rotary jars; rotary spears; casing cutters; tubing cutters; drill pipe cutters; fishing tools.

B. F. McDonald Co.
Houston, Tex.

Booth 348, Coliseum

In attendance

B. F. McDONALD — J. J. DELAHIDE
M. M. McFADDIN — J. P. REPP

Exhibiting a complete line of safety appliances including McDonald safety hats, dustfoe respirators, gas masks of all types, gas indicators, gas detectors, safety goggles, self-contained oxygen breathing apparatus, safety clothing, inhalators, safety belts, Edison electric cap lamps, and McDonald unit first aid kits and refills.

McEvoy Company
Houston, Tex.

Booths 555, 557, Coliseum

In attendance

G. S. WATSON — J. H. McEVOY
A. HENDERSON — WALTER THOMAS
MOREY ZORGDRAGER

Equipment on display: McEvoy wireless well screen; McEvoy wire wrapped well screen; McEvoy gravel packed well screen; latest type liner packers; improved set shoe assemblies; new high-pressure well heads and well-control equipment, both flanged type and screw type; latest styles of christmas trees; McEvoy Hosmer type blowout preventers.

McGill Manufacturing Co.
Valparaiso, Ind.

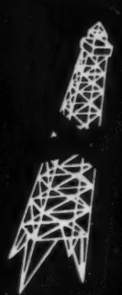
Space 1143, Annex

DO TELL TALES

Under normal conditions, the drilling of a dry hole is now an expose, revealing either misinterpretation on the part of the geophysicist or a bad guess on the part of the one who stakes the location without knowledge of the true subsurface structural conditions.

We are proud of the fact that our clients have drilled conspicuously few dry holes. With few exceptions, their drills have proven the accuracy of our calculations . . . within a few feet. We can reduce your dry hole losses, too!

Seismic
EXPLORATIONS, INC.
HOUSTON, TEXAS



Gotkool
WATER CANS
& COOLERS
GOTT Water Cans are the practical way to keep drinking water cool for long periods, protected from impurities and always handy to the job. Snug fitting large removable top, strongly built to withstand rough usage. GOTT Water Coolers have extra large covers and a handy non-leaking push button faucet. Your Supply Store has them, get one today!
GOTT WATER CAN
Made in 1½, 3, 5, and 10 gallon sizes.
GOTT WATER COOLER
Made in 3, 5, 8, 10, and 20 gallon sizes.
H. P. GOTT MFG. CO.
WINFIELD, KANSAS
KEEP PURE DRINKING WATER ALWAYS HANDY

HUSKY

WHERE HUSKINESS COUNTS

● Trucks **have** to be **rugged** to stand up under the loads, the twists and strains, the battering, gruelling punishment of oil field hauling jobs. They have to be husky where huskiness counts—**in the axles!** Timken 6-Wheel Tandem Drive Axle Units are designed and built especially for this heavy duty work on and off the highways. Buy your trucks equipped with Timken Tandem Drive Units—the **Accepted Standard—proved** dependable.

TIMKEN

6 WHEEL TANDEM DRIVE UNITS

The Timken-Detroit Axle Co. • Detroit, Mich.

McKissick Products Corp.
Tulsa, Okla.

Space 1141, Annex

McNeely Materials Co.
Houston, Tex.

Spaces 1240, 1242, 1244, Annex

MacClatchie Manufacturing Co.
Compton, Calif.

Spaces 1200, 1201, Annex

Macwhyte Company
Kenosha, Wis.

Booth 513, Coliseum

In attendance

H. E. SAWYER, vice president; A. B. MOSELEY, assistant sales manager; F. E. BENNETT, representative; G. JOHNSTON, representative; H. M. ROBINSON, representative.

Displaying complete line of wire rope for the oil fields, including rotary lines, cable tool lines, sand or bailing lines, and on special display a Macwhyte Whyte Strand 1⅛-inch 6x19FB IWRC PREformed rotary line.

Magnolia Airco Gas Products Co.
Houston, Tex.

Spaces 1104, 1106, 1108, 1219, 1221, 1223, Annex

Maintenance Engineering Corporation
Houston, Tex.

Booths 608, 610, 612, 614, 616, 709, 711, 713

In attendance

C. E. NAYLOR, president; W. J. PEDDIE, vice president; W. B. RAWSON, sales engineer; M. N. AITKEN, sales engineer; C. N. SCHWARZ, sales engineer; G. T. MOORE, sales engineer; JIM WISEMAN, sales engineer; E. B. HALDEMAN, sales engineer; ROBERT COGSWELL, sales representative; C. K. BROWN, sales representative; W. H. LEVERETT, shop superintendent.

The corporation invites all oil field and refinery men to attend its exhibit. It is the desire of the entire personnel of this company to give to the oil industry a complete and thorough knowledge of the equipment handled by this company. In addition to its regular line of oil-field and refinery equipment it takes this opportunity to show to those interested its complete line of forged steel valves and fittings.

Complete descriptive literature on equipment to be shown will be available.

Marmon-Herrington Co., Inc.
Indianapolis, Ind.

Spaces 1023-B, 1028-A, Outside

Seven vehicles will be on display, including converted Fords and heavy-duty Marmon-Herrington all-wheel-drive trucks, with rated load capacities from

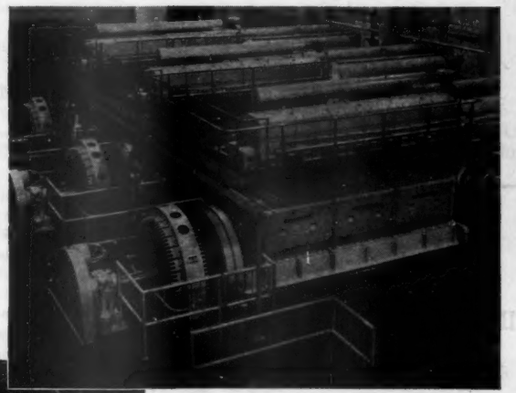
Marmon-Herrington FD5-4 all-wheel-drive Ford with Diesel engine

one-half ton to 7 tons, and the new Marmon-Herrington all-wheel-drive "Marsh buggy" which all but "floats" over swamps and marshland absolutely impassible for any other vehicle.

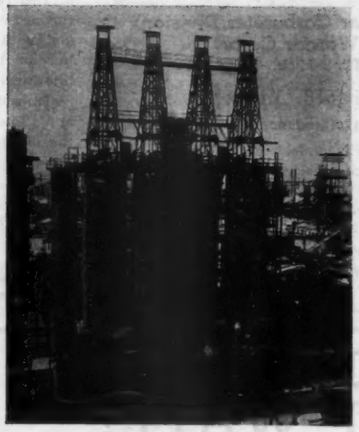
All-wheel-drive vehicles have traction on the front

(Continued on Page 222)

INDUSTRY...

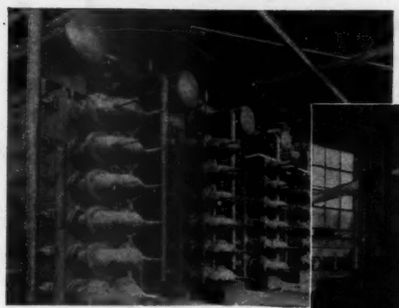


Right—Three of four Worthington Convertible Gas-Diesel Generating Units, in the service of a leading petroleum producer



Complete hydraulic decoking and coke transportation systems for economical removal and transportation of coke from coke chambers in oil refineries

Two Worthington Centrifugal Pumping Units . . . three pumps in line . . . each driven by Moore Turbine operating on natural gas, for rich oil, lean oil and reflux service



Above—Worthington-Carbondale Chilling Machines, for ammonia direct-expansion operation, in a solvent dewaxing plant

Below—Worthington-Carbondale Horizontal 2-stage Ammonia Compressors, motor-driven, dewaxing oil in a refinery

Worthington Equipment provides COMPLETE COVERAGE
For every important operation . . . at every important step

The increasing acceptance of Worthington products has been established on the solid basis of consistent performance over a wide range of exacting applications.

There is a Worthington unit to meet every condition exactly . . . without compromise in selection.

Production • Transportation • Refining

WORLD WIDE SERVICE

WORTHINGTON PUMP AND MACHINERY CORPORATION

General Offices: **HARRISON, NEW JERSEY** - *Branch Offices and Representatives in Principal Cities throughout the World*

WORTHINGTON-SIMPSON LTD., LONDON, ENGLAND
WORTHINGTON, S. A., PARIS, FRANCE
DEUTSCHE WORTHINGTON, G. M. B. H., BERLIN AND WIEN, GERMANY
SOCIETA ITALIANA POMPE E COMPRESSORI, MILANO, ITALY

THINGTON

wheels, traction on the rear wheels, and traction on an extra pair of wheels behind. The company converts all standard Ford trucks, commercial and passenger cars to all-wheel-drive, and builds a line of more than 30 extra heavy-duty all-wheel-drive trucks with load capacities up to 25 tons.

Marvel-Schebler Carbureter Division, Borg-Warner Corp.
Flint, Mich.

Booth 1518, Annex

In attendance

C. M. KALTWASSER, president
DAVID FIRTH, vice president
S. W. GRAY, chief engineer
J. STORER, engineer
E. RECTOR, engineer
W. C. PIERCE, regional manager
N. M. HURRY, service sales manager

The company will exhibit the Diesel injector and its oil burning carburetor. The Diesel injector is a new item with the company, which it is developing at its plant.

The company describes its oil-burning carburetor as something entirely new in the industry, a carburetor which starts on gasoline and after a moment or two can be switched over to low-grade fuel oil or furnace oil. It can burn No. 3 furnace oil if necessary and with no serious effect on the engine. This carburetor has been designed to enable standard gasoline burning automotive or Diesel engines to burn oil, which will mean a tremendous saving for fleet owners and those who use industrial engines, particularly in the oil fields.

Manning Oil Specialties
Houston, Tex.

Spaces 1552, 1554, Annex

Products to be exhibited: Thompson sand pumps; Purcell cathead (interchangeable sleeve); "Sure Shot" well-survey instrument; Merritt pipe hook and rathole elevator; Asbestos Manufacturing Co. brake lining.

Mason-Neilan Regulator Co.
Boston, Mass.

Spaces 608, 610, 612, 614, 616, 709, 711, 713, 715, 717, Coliseum

In attendance

F. K. MORRISON, sales manager; C. W. WOOD, sales engineer; CARL GRAM, sales engineer; W. B. RAWSON, sales engineer.

Exhibiting control equipment including control instruments, pneumatic transmitting systems, liquid level controllers, remote manual control units, control valves and regulators.

Martin-Decker Corp.
Long Beach, Calif.

Spaces 1007, 1012, Outside

In attendance

E. L. DECKER, secretary and treasurer
L. A. (PETE) CRAWFORD, Mid-Continent salesman
JACK CLEMENS, Mid-Continent salesman

Products to be exhibited: Quintuplex drilling control instrument, individual mud pump gauge, unitized mud pump gauge, Clipper weight indicator, cable tension indicator, measuring line weight indicator, pump dynamometer, pull-rod dynamometer, pulsation damper. Also four new products: "Special" illuminated weight indicator, slim-hole weight indicator, 1,000-pound unitized mud pump gauge, Radium recording thermometer.

The "Special" illuminated weight indicator, it is stated, incorporates in one compact unit every important feature for proper weight control where portability is essential and a permanent record of operations is not required. The dial face is extra large and has built-in illumination, giving complete 24-hour visibility from any place on the rig floor. Ten interchangeable dials nested within the case give direct readings in pounds or points.

The slim-hole weight indicator is especially built for use in shallow fields, with either light stationary outfits or portable equipment.

The 1,000-pound unitized mud pump gauge incorporates every feature of the larger unitized mud pump gauge, with the exception that it has lower capacity, and does not incorporate the vernier-retard feature. A new mechanism and a new dial face make this instrument completely adaptable for use on low pressure mud lines in shallow drilling.

The Radium recording thermometer is an entirely new type of instrument for measuring oil well temperatures.

Geo. S. Mepham Corporation
East St. Louis, Ill.

Booths 415-417, Coliseum

In attendance

L. K. AYERS — TOM BERGIN
HART GREEN — E. F. BROWNHILL
J. T. PATTERSON, JR. — B. L. JONES
H. E. EMMERTON — KEMP LEWIS
WILEY STEEN — FRED POE
J. A. COULSON

Exhibition will consist of drilling muds and chemicals for treatment of same. If possible, photographs of the company's new plant, now being erected in Texarkana for the manufacture of Colox. This plant, it is said, will be the largest in the world devoted exclusively to the manufacture of drilling muds.

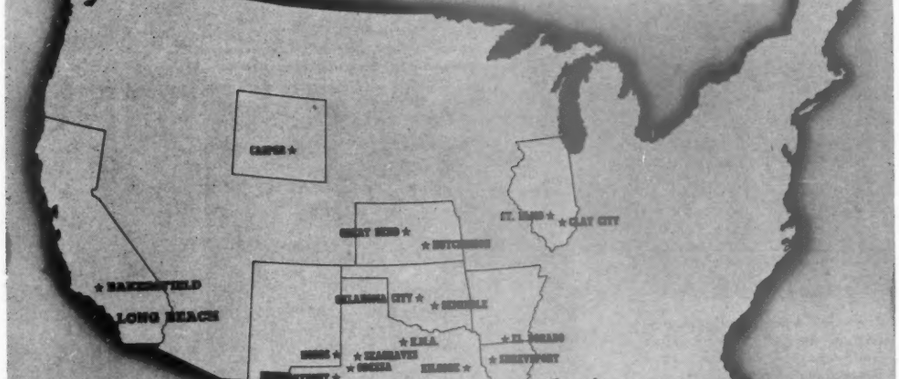
Merco Centrifugal Company
San Francisco, Calif.

Spaces 504, 506, 508, 510, 605, 607, 609, 611, Coliseum, and Booth 1048, opposite main entrance

Exhibiting a new and interesting model of rotary drilling mud centrifugal desander. This machine is of a size and capacity between Type A-20 and Type A-30 which have been in use in the oil fields for the past decade. The new machine, while embracing the same principles of separation and operation as the older machines, is more efficient, more compact and lighter and will be presented to the industry at a considerable saving in cost over the Type A-20, in fact, this machine is expected to replace both the A-20 and the A-30. The machine will be exhibited in operation and

TOOL PUSHERS CAN'T WAIT!

And they don't have to with* MARTIN-DECKER *fast service!



In the oil fields, time means money — and Tool pushers can't wait when crews are rigging up or working on those short jobs where time is a big factor in cutting costs. That's when Martin-Decker's *fast service* saves operators money, gets the job done — and gets it done *now!*

Martin-Decker has 21 established *distribution and service points in every important oil field from California to Illinois* to insure operators uninterrupted service on the installation, care and maintenance of instruments used on their rigs!

Call your nearest Martin-Decker Service Man *today* for any installation or maintenance problem you may have!

See the new Slim Hole Weight Indicator and the new 1000 Lb. Unitized Mud Pump Gauge at the Show.

THE SPECIAL

is an accurate and sensitive instrument that features indirect illumination, positive readability, greater load capacity and lighter weight. It is the indicator you need for all drilling and production operations where portability is essential and a chart record is not required.

Write for full details!

HOME OF THE WEIGHT INDICATOR

MARTIN DECKER CORP.

LONG BEACH, CALIFORNIA

SAN JOAQUIN VALLEY: A. F. McQUISTON, BAKERSFIELD, CALIFORNIA
MID-CONTINENT DISTRIBUTOR: REED ROLLER BIT COMPANY, HOUSTON, TEXAS

will be in charge of the company's field engineer, Albert Peltzer, Jr., who will be glad to answer any questions in connection with the new machine.

Metal Goods Corporation
St. Louis, Mo., and Houston, Tex.

Booths 564, 664, 665, Coliseum

In attendance

SAM D. HODGDON, district manager
CARL T. WEDEMEYER, assistant district manager
R. J. RICE, foundry engineer
HARRIS T. GREGG — L. E. FULLER
C. J. McGUIRE — H. C. RIEDEL
EDWARD SCHWARTZ

In preference to stressing a few items, the corporation is placing importance on the fact that large and varied stocks of nonferrous metals are available for immediate shipment from three well located warehouses in the Middle West and Southwest. This feature will share prominence with the offer of assistance in problems of a technical nature. International Nickel Co., American Brass Co., and Aluminum Co. of America maintain large staffs for development and research work. Many of their men specialize in alloys for the oil trade. The services of these men as well as Metal Goods Corp. engineers are prepared to serve the petroleum industry.

Mid-Continent Supply Company
Fort Worth, Tex.

Spaces 1001, 1002, outside

In attendance

K. W. DAVIS, President, Fort Worth, Tex.
D. H. THORNBURY, vice president, Houston, Tex.
J. A. DAUGHERTY, vice president, Tulsa, Okla.
J. C. HALBERT, secretary-treasurer, Fort Worth, Tex.
F. J. SPURLOCK, sales manager, Fort Worth, Tex.
F. JOHN, purchasing agent, Fort Worth, Tex.
R. O. MOORE, general merchandise manager, Fort Worth, Tex.
C. D. HELM, sales engineer, Fort Worth, Tex.
A. S. GEORGE, manager, manchinery department, Fort Worth, Tex.
P. H. EDWARDS, sales engineer, Fort Worth, Tex.
T. M. CONE, designing engineer, Fort Worth, Tex.
H. H. BROWN, branch manager, Dallas, Tex.
A. E. LeCLAIRE, store manager, Houma, La.
H. E. HAMILTON, district sales manager, Houston, Tex.
W. I. WEST, district manager, Houston, Tex.
H. McMURRY, store manager, Houston, Tex.
J. E. EVERROAD, sales engineer, Houston, Tex.
L. L. WINTERS, Houston, Tex.
A. L. SMITH, sales engineer, Houston, Tex.
R. E. FULLER, Houston, Tex.
O. A. SCHILLING, Houston, Tex.
S. W. WOOLSEY, Houston, Tex.
HERBERT MUERY, Houston, Tex.
T. W. RATCLIFFE, JR., Houston, Tex.
R. C. TUCKER, district manager, Odessa, Tex.
T. P. TARWATER, store manager, Odessa, Tex.
J. W. HOOVER, sales manager, Odessa, Tex.
R. L. McANALLY, store manager, Kermit, Tex.
F. R. FILES, store manager, Kilgore, Tex.
E. H. HOLCOMB, sales engineer, Kilgore, Tex.
G. H. CANTERBURY, store manager, Lake Charles, La.
A. T. SKAER, store manager, Lisbon, La.
C. M. FLEEMAN, store manager, Magnolia, Ark.
G. A. WEAD, store manager, Refugio, Tex.
H. P. MOORE, store manager, Rodessa, La.
G. W. WALTERS, store manager, Seagraves, Tex.
S. W. BACKUS, district manager, Shreveport, La.
T. A. BROWN, sales engineer, Shreveport, La.
P. J. DASEY, sales engineer, Tulsa, Okla.
C. R. BROOKS, store manager, Turnertown, Tex.
W. P. MASON, store manager, Wichita Falls, Tex.

Manufacturers' Equipment Included in Display and Representatives Attending

Cummins Engine Co., Columbus, Ind.

C. L. CUMMINS, president
J. I. MILLER, general manager
P. E. LETSINGER, vice president, charge of sales
DAVE BUTTLES, sales manager
S. W. CURTISS, advertising manager
D. B. WORTH, manager, industrial division
J. B. CHAMBERS, Mid-Continent region, Fort Worth Tex.

American Car & Foundry Co., New York, N. Y.

W. R. KOTTSIEPER, assistant sales manager, valve department, New York
W. C. MOONEY, Dallas, Tex.

Allis-Chalmers Manufacturing Co., Milwaukee, Wis.

RAY ENTERS, Texrope division, Milwaukee, Wis.
W. A. MEYER, Texrope division, Wilwaukee, Wis.
O. A. HAAS, district manager, Tulsa, Okla.
G. H. de la VERGNE, Dallas, Tex.
D. M. McCARGAR, Houston, Tex.

Bethlehem Steel Co., Bethlehem, Pa.

J. C. MILLER, manager of sales, Bethlehem, Pa.
P. E. McKINNEY, metallurgical engineer, Bethlehem, Pa.
CHARLES M. BALLARD, Bethlehem, Pa.
W. R. SHIMER, Bethlehem, Pa.
JOHN J. LOVELL, Tulsa, Okla.
J. E. MOORE, Houston, Tex.
C. B. HINTON, Houston, Tex.
M. P. LEONARD, Dallas, Tex.

Emsco Derrick & Equipment Co., Los Angeles, Calif.

P. D. BROWNE, plant manager, Houston, Tex.
L. W. STAHL, chief engineer, Houston, Tex.
GEORGE W. WALTON, vice president and manager, Midco Machinery division, Dallas, Tex.

General Electric Co., Schenectady, N. Y.

A. H. KEEN, Fort Worth, Tex.
G. R. PROUT, Dallas, Tex.
GEORGE CURRY, Houston, Tex.

Gardner-Denver Pump Co., Quincy, Ill.

R. L. McCLAIN, Dallas, Tex.
W. E. SHAUGHNESSY, Dallas, Tex.

Helm Manufacturing Co., Fort Worth, Tex.

A. C. HELM

Hewitt Rubber Corp., Buffalo, N. Y.

L. D. BIGELOW, vice president, Chicago, Ill.

International Derrick & Equipment Co., Beaumont, Tex.

R. R. BLOSS, president and general manager, Beaumont, Tex.
E. H. EDDLEMAN, general sales manager, Dallas, Tex.

The Locomotive Finished Material Co., Atchison, Kans.

H. E. MUCHNIC, president
A. H. MOORHEAD, sales manager

The Ludlow Valve Manufacturing Co., Troy, N. Y.

A. W. THOMPSON, vice president, Troy, N. Y.
R. B. TROW, district manager, Houston, Tex.

Mid-Continent Pump & Supply Co., Tulsa, Okla.

R. A. DUNBAR, president
R. VAN MATRE

Manheim Manufacturing Co., Manheim, Pa.

STUART GOURLEY, sales manager, Manheim, Pa.
VINCENT K. ALEXANDER, branch manager, Chicago, Ill.

Naylor Pipe Co., Chicago, Ill.

E. W. NAYLOR, vice president
N. E. TURNEY, sales manager

Perfex Radiator Co., Milwaukee, Wis.

G. C. HOLT, vice president in charge of sales

Twin Disc Clutch Co., Racine, Wis.

G. M. GUILBERT, vice president, Racine, Wis.
J. B. JENKINS, district manager, Tulsa, Okla.

Exhibiting:

Mid-Continent—Cummins Model M-21 V-belt mechanical rotary rig drive powered by two 225-hp. Cummins engines (one engine using Diesel fuel and one using natural gas).

Mid-Continent—Cummins Diesel rotary auxiliary (utility) unit consisting of a Model "A" 4-cylinder, 25-hp. Cummins 4-cycle, full Diesel engine with electric starting.

Cummins cold starting full Diesel 125-hp. 6-cylinder power unit, Model HP-600, left-hand rotation with special 4-speed transmission for separate engine drive to rotary table.

Cummins cold starting full Diesel 175-hp. 6-cylinder, Supercharged engine, Model HPS-601, driving mud pump, with clutch, radiator and fan equipment.

Cummins cold starting full Diesel 150-hp. 6-cylinder marine engine, Model No. HMR-602, with marine reverse gear.

Cummins cold starting full Diesel 35-hp. 4-cylinder engine, Model AP-400-C, driving 4½- by 6-inch Gardner-Denver duplex power pump.

Cummins cold starting full Diesel 55-hp. 6-cylinder engine, Model AP-600-C, driving Emsco geared pumping unit.

Cummins cold starting full Diesel 67-hp. 4-cylinder marine engine, Model AMR-400, with marine reverse gear.

Cummins cold starting full Diesel 100-hp. 6-cylinder marine engine, Model AMR-600, with marine reverse gear.

Cummins cold starting full Diesel 450-hp. 12-cylinder power unit, Model VLP-1202.

Ideco "Little Giant" drawworks, 23-inch rotary table, and two-speed reversing countershaft.

Gardner-Denver 4½- by 6-inch power driven duplex pump.

Emsco 7¼- by 12-inch power driven slush pump with cast steel fluid end, 2,000 pounds working pressure, 3,000 pounds test pressure.

Emsco 7¾- by 16-inch power driven slush pump with forged steel fluid end, and 3,000 pounds working pressure, 6,000 pounds test pressure. The fabricated steel power end is rated 330 hp. at 55 r.p.m.

Emsco 15½- by 7¾- by 20-inch steam slush pump with forged steel fluid end, 3,000 pounds working pressure, 6,000 pounds test pressure.

Emsco D20-TPM 4-hp. twin crank, portable, double reduction, roller bearing equipped, continuous tooth herringbone geared pumping unit.

Emsco D40-TPM 8-hp. twin crank, portable, double reduction, roller bearing equipped, continuous tooth herringbone geared pumping unit.

Emsco D77-TPM 15.3-hp. twin crank, portable, double reduction, continuous tooth herringbone geared pumping unit.

Emsco D165-TPM 33.3-hp. twin crank, portable, double reduction, continuous tooth herringbone geared pumping unit.

Emsco S255-TPM 51.5-hp. twin crank, portable, single reduction, continuous tooth herringbone geared pumping unit.

Pacific oil well pumps with working and cutaway models showing streamline cages and how gas is handled.

Bethlehem fully normalized A.P.I. sucker-rods including a display of Bethlehem's exclusive methods of fully protecting rods for handling, loading, transporting, unloading, and stacking.

Bethlehem wire rope with Unizact core showing Bethanizing process.

Ludlow gate valves—No. 4 and No. 5½ cutaway models—No. 5½ and No. 8 complete valves.

Mid-Continent automatic relief valves for oil pipe line service.

Mid-Continent low air pressure surge chamber for alleviating surge in oil pipe lines.

Famous brand cutaway specimens of rotary hose.

A.C.F. full area lubricated plug valves.

Wisconsin single-cylinder air-cooled gas-gasoline engine driving 4-hp. pumping unit.

Veelos detachable V-belting. Drives on rig utility unit and an individual well pumping unit.

Allis-Chalmers V-belt sheaves on rotating elements for drawworks drive.

Naylor Spiralweld line pipe and surface casing.

Locomotive Finished Material Co. Combination union and check valve. Universal piston rings, and Universal cylinders.

Mid-Continent well gas detector for detecting the presence of gas in drilling muds and to indicate the penetration of gas or other sands which will discharge gases into drilling mud.

Mid-Continent fluoroscope for examining mud specimens and to determine the location of oil-bearing sands.

Midco Tool & Supply Co.
Oklahoma City, Okla.

Space 1101, Annex

Mine Safety Appliances Company
Braddock and Pittsburgh, Pa.

Booths 313, 315, Coliseum

In attendance

H. L. PHILLIPS — G. J. GRUBER
R. M. NICHOLSON — H. W. RICHARDS
P. B. SIMPSON

The following new safety products will be exhibited in addition to the standard ones: A displacement blower that supplies air metered to the worker's requirements and with nearly effortless ease of operation; the light, compact Midget Impinger that samples dusts without need of power requirements; a benzol indicator which is 15 times as sensitive as any combustible gas indicator and accurately determines benzol concentrations in air; salt dispensers of one-at-a-time pocket size and the 1,500-tablet bakelite type; an electrostatic dust and fume sampler designed for quantitative sampling of dust, fume and mist; a two-fold safety product, the M.S.A. Skullgard-welding shield combination; coated cover glass for welding and cut-

ting; a new triple-life hydrogen sulfide canister; the M.S.A. fire blanket, and a new detector for determining concentrations of hydrocyanic acid gas.

Mission Manufacturing Company
Houston, Tex.

Booths 304, 306, 405, 407, Coliseum

In attendance

W. T. CAMPBELL, vice president and sales manager
JOHNNIE BEST, assistant sales manager
R. M. GARRISON, chief engineer
E. H. TRAMMELL, manager of export

Products to be exhibited: The company's rotary slips, one-piece type, rotary slips, two-piece type, casing slips, tubing spiders, slush pump valves, seat pullers, slush pump pistons, piston rods, self-sealing gland packing, valveless swabs, casing swabs, plug valve.

The rolling dog rotary slip, one-piece type, is designed for maximum safety and reliability, and recommended for use in deeper oil wells—particularly those below 10,000 feet. Hinged so that all segments must remain at the same level in the rotary at all times. This, it is stated, is positive protection against crimped pipe due to slips being uneven as they grip the pipe.

The company's casing swab weighs only 29 pounds, easy to handle. When used on top of tools as in wells, cased to bottom, or near bottom, simply clamp the two halves of the swab around the line above the rope socket which functions as a seat for the swab. A wire rope clamp placed just above the swab prevents it from going up the line while running in. Lightness in weight, and the fact there are no joints to make or break, accounts for the quick changing time.

With the company's self sealing gland packings the seal is secured from fluid pressure which, it is stated, greatly prolongs the life of piston rod and gland packing as it prevents cutting of rod by leaking fluid because seal is positive and increases as the pressure is raised. The packing is under pressure only when the seal is needed.

The company's plug valve is a new design in plug valves, having a two-piece, straight plug. This special design, it is stated, insures a perfect fit with less friction resulting in a sure seal-off and extreme ease of opening.

Modern Engineering Company, Inc.
St. Louis, Mo.

Space 1041-A, outside

In attendance

JOHN J. KEANE CHARLES FAUSEK

Demonstrating the MECO Safe-T-Chek regulator on an oxygen tank with the adjusting screw screwed up to 100 pounds and open it suddenly; the Little Pal portable acetylene generator, and the MECO automat welding torch as well as the Weldmaster line of welding torches with the gasket type joint. Also showing for the first time the Cutmaster cutting torch.

Motor Improvements, Inc.
Newark, N. J.

Booths 509-511, Coliseum

In attendance

J. A. GRAHAM, president
F. P. HERMAN, manager factory equipment sales
H. B. GRAHAM, sales engineer
S. T. McCORMICK, sales engineer
T. R. COLLIOUD, district representative
A. E. BELL, engineer

The company introduces a new removable element lubricating oil filter which extends the crankcase filtering capacity range of this type of Purolator. This new type known as the N-30, provides twice the filtering capacity of the N-29, formerly the top size of this series. The N-30 is recommended for Diesel engines having a crankcase capacity of from 20 to 35 quarts. When installation is made on gasoline engines, crankcase capacities up to 35 quarts are filtered.

The replaceable element of this Purolator is of the depth type and employs new patented principles that permit distributing the oil throughout all of the filtering material.

By utilizing all of the filtering material, a fine degree of filtration is obtained and at the same time the filter element is enabled to filter from the oil and retain a greater amount of dirt. As the direction of filtration is from the inside to the outside, there is no accumulation of dirt at any time in the outside filter case. For this reason, elements can be changed without draining the filter and without the necessity of cleaning dirt from the bottom of the outside case.

The Jno. Muller Co.
Fort Worth, Tex.

In attendance

R. D. MORRISON GEORGE KLUPPEL
TOM EVANS A. D. BARR

The company will also have representatives present from its Fort Worth, Kilgore, and Odessa stores.

Display includes J-M heavy-duty brake lining, Air Maze air filters, Witte Diesel and Wisconsin air-cooled engines, Oil Pure refiners.

The Grease Pak Sub-Surface Pump, recommended for sand, corrosion, and efficiency, lower maintenance cost, will also be displayed.

Murray Iron Works Co.
Burlington, Iowa

Space 1517, Annex

CRC

SEE:

THE NEWEST DEVELOPMENTS
IN
PIPE LINE EQUIPMENT
ON EXHIBIT
IN THE
W-K-M BOOTHS
OIL-WORLD EXPOSITION

HOUSTON
April 24-29th

CRUTCHER-ROLFS-CUMMINGS-INC.
Specializing in
PIPE LINE EQUIPMENT AND MATERIALS
HOUSTON, TEXAS U.S.A.

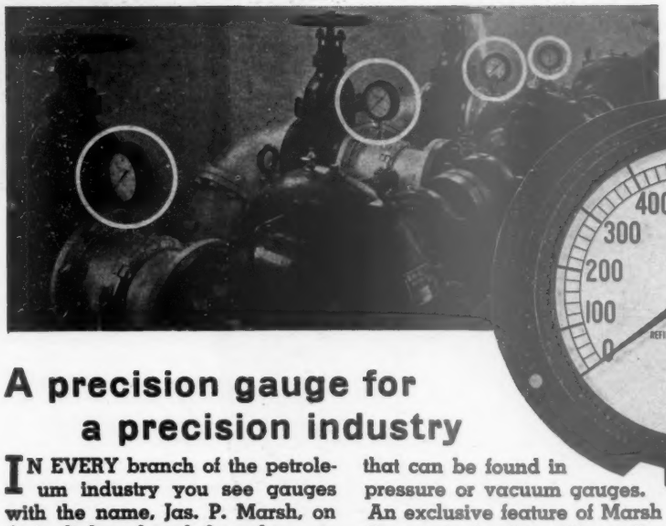
CRC

WHEN YOU'RE IN A TIGHT SPOT, *use* TUBE-TURNS!

When a really tough piping job comes up, such as crowding several new lines into a tunnel carrying a number of old ones—that's when you can "thank your stars" for welding and for Tube-Turns! Welded lines nest better and require less space. They are easier to insulate and, being lighter, require fewer hangers. Best of all, they are *permanently leak-proof*. . . For utmost ease of installation and best results from all kinds of piping, nothing can take the place of Tube-Turns. Uniform in wall-thickness, truly circular in cross-section, they line up perfectly with the pipe—make the welder's job easier and faster. . . Tube-Turns cost no more than other makes of seamless welding fittings. *Their extra values cost you nothing.* Get the facts from your nearest distributor—or write direct for Catalog 107.

The word "Tube-Turn" is NOT a necessary general trade name for welding fittings. It is the registered trade-mark for the products made by Tube-Turns, Incorporated, under their patents.

TUBE-TURNS
Incorporated
LOUISVILLE, KY.



Marsh pressure gauges on centrifugal circulating pumps in natural gasoline plant.

A precision gauge for a precision industry

IN EVERY branch of the petroleum industry you see gauges with the name, Jas. P. Marsh, on their dials—placed there by men who believe that only a real, precision gauge is good enough for a precision industry.

From the simplest, single spring pressure gauge to the Marsh Refinery Gauge with lathe-turned bourdon tube equal to any pressure or temperature, Marsh Gauges unquestionably offer the most advanced design and construction that can be found in pressure or vacuum gauges. An exclusive feature of Marsh Gauges is the "Recalibrator"—the first means of zero adjustment that actually corrects the gauge at all points on the dial. The Marsh line is complete. It includes gauges of all types and ranges, recording gauges, dial thermometers and recording thermometers. See your supply house for details covering the broad Marsh line of indicating instruments that *stay* accurate.

JAS. P. MARSH CORPORATION, 2065 N. Southport Ave., Chicago, Ill.

Ask for facts about the new Marsh Refinery Gauge illustrated above — a moisture-proof, vapor-proof, dust-proof gauge, specially built to meet the most arduous conditions encountered in the petroleum industry.

MARSH GAUGES

From Completion to Depletion—SUPERIORITY Shows up in *Performance*

Bryan Flow Valve Type SDX

. . . . And PERFORMANCE you get in the positive automatic operation of **Bryan Flow Valves** which insure definite control at all times. Let us give you FACTS of our proved successful methods of "gas lift".

Gas Lift
CORPORATION
SHELL BLDG. HOUSTON, TEXAS
Charter 4-1521

Kilgore, Texas Phone 672
Midland, Texas Phone 736
Atlanta, Texas Phone 6
Beeville, Texas Phone 33

GAS LIFT CORPORATION · BRYAN FLOW VALVES · DALLAS

See Our Exhibit at the Oil-World Exposition—Booth 1215

Renew Your Subscription Today

National Aluminate Corporation
Chicago, Ill.

Booth 765, Coliseum

In attendance

E. F. FELLOWS, division manager
J. L. HICKMAN, Houston, Tex., field engineer
ANDREW O. JAROS, Hobbs, N. M., field engineer
R. S. MORCOM, New Iberia, La., field engineer

Exhibit will consist largely of charts, photomicrographs and actual samples of all types of scales, corrosion, caustic embrittlement, etc. Field analysis apparatus will be shown and a few pieces of special apparatus.

National Carbon Company
Carbon Sales Division
Cleveland, Ohio

Booths 109, 111, 113, 115, Coliseum. Exhibiting jointly with other units of Union Carbide and Carbon Corporation

In attendance

H. H. FRASCH — S. A. MATTISON
M. J. DORCAS — G. H. MAYER, JR.

Exhibit will consist of carbon tower sections, carbon Raschig rings for tower packing, carbon brick and tile. Application of these materials to various forms of construction will be demonstrated. Many of these applications are new and offer the industry a material of construction of considerable economic advantage. The exhibit will also include a display of carbon ground rods available in 2-, 4- and 6-inch diameters by 80 inches long designed for the cathodic protection of pipe lines.

The National Supply Company
Pittsburgh, Pa.

Booths 237, 241, 136, 140, Coliseum

In attendance

J. A. GEISMAR, vice president and general manager
D. S. FAULKNER, vice president
L. V. BOGGS, vice president
C. C. CARTWRIGHT, vice president
H. O. POWELL, assistant to vice president
A. W. McKINNEY, manager of sales
H. L. PUTNAM, division sales manager
C. A. McCOLLUM, division manager
M. F. CRIBBS, division manager
W. F. SMITH, division manager

Reception booth only. No equipment.

National Tank Company
Tulsa, Okla.

Booths 252, 254, 256, Coliseum

In attendance

F. L. SENTER — S. S. PARKER
C. W. IMMEL — C. O. RELEPHORD
L. S. ALLEN

Products exhibited will include an automatic emulsion treater built in reduced scale and with a transparent shell to disclose the internal arrangements. This unit will be in operation to illustrate the flow of the fluids and the methods of treating.

A miniature tank battery will be exhibited which will show in detail the latest in battery hookup and accessories. This tank battery will be complete with a scale model A.P.I. walkway and stairway.

A full-sized, high-pressure National oil and gas separator will be exhibited, showing the operation of its hookup accessories. This will be accompanied by a three-quarters section scale model which will show the internal arrangement.

There will also be shown Armco-National spiral welded surface casing, Tite-Line couplings, low-pressure safety relief valves, etc.

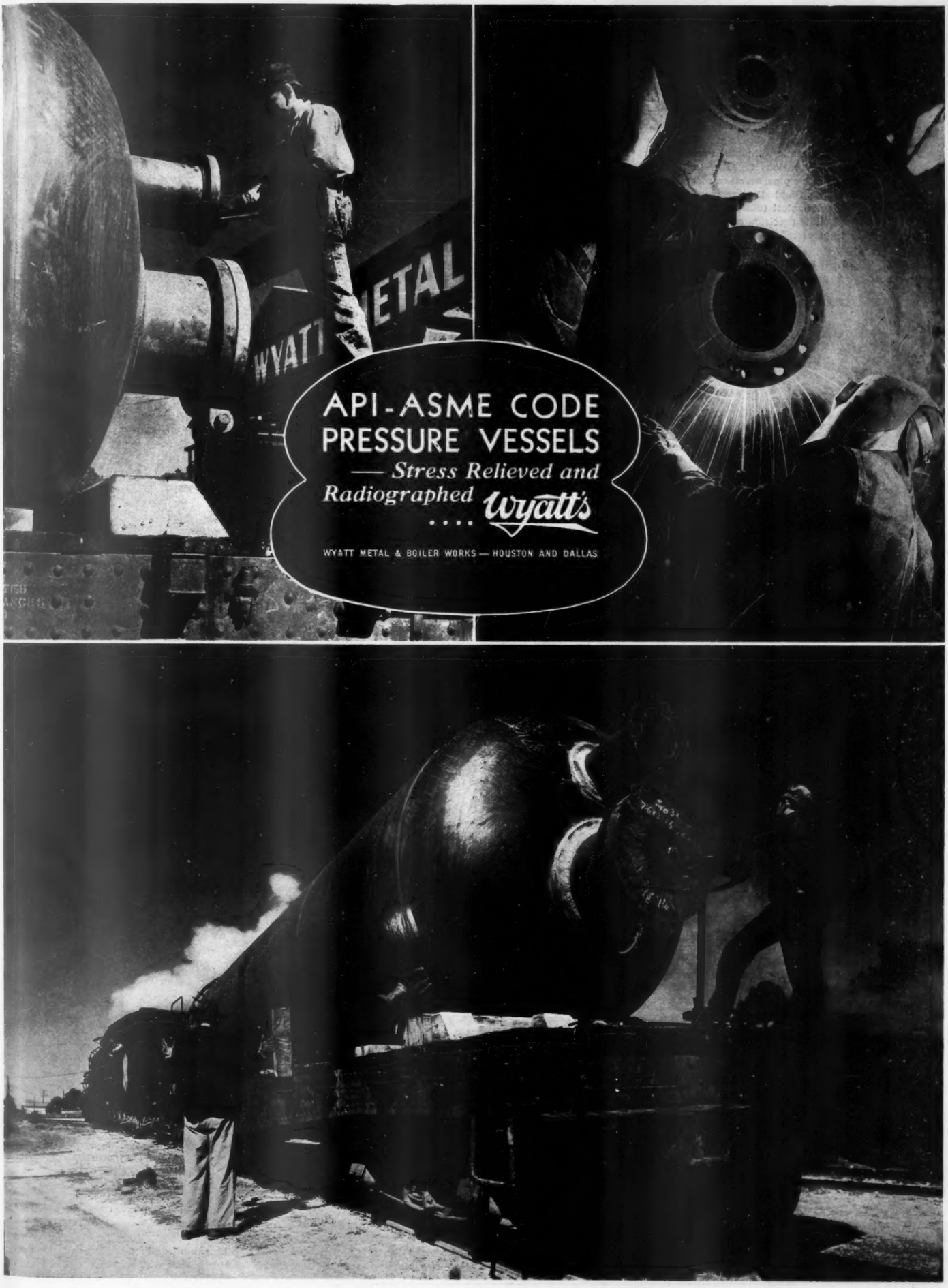
National Tube Company
Pittsburgh, Pa.

Booths 633, 641, Coliseum

Feature will be a working replica of a seamless mill showing a solid round of steel passing through piercing rolls—the most important operation in the manufacture of seamless pipe and tubes.

A large panel will bring out advantages of round threads as applied to casing and oil well tubing. Round threads were pioneered by National Tube Co.—for drill pipe in 1922, and for casing and tubing in 1931.

Another large panel will show "America's most com-


API-ASME CODE
PRESSURE VESSELS
— Stress Relieved and
Radiographed
wyatt's
WYATT METAL & BOILER WORKS — HOUSTON AND DALLAS

plete tube service for refineries"—21 tubes of different analyses (from low carbon ranging through the lower and higher chrome alloys to 25 per cent chromium 20 per cent nickel). Accompanying each tube will be a chart giving the chemical and physical properties, characteristics, and applications for each tube.

Samples showing the latest developments in oil-country tubular products will be exhibited, including:

National round thread seamless casing; seamless internal upset casing; seamless slip joint casing; combination casing string; seamless internal upset tubing; seamless drill pipe with various types of tool joints; seamless line pipe; Duroline pipe; seamless refinery pipe and tubes in plain carbon and all alloys applicable.

Shelby seamless mechanical tubing; seamless working barrel tubes; seamless precision pump tubes; seamless fluid packer tubes.

Nixdorff-Krein Mfg. Co.
St. Louis, Mo.

Booth 1576, Annex

In attendance

B. SANDER — W. B. DORMAN
E. LITTMANN — G. K. MORGAN
H. D. WHITLEY — FOREST R. EYER
CASH DEAN

Will exhibit welded chains, all descriptions, tire chains for passenger cars and trucks, tire chain accessories, grab hooks and cold shuts.

Norma-Hoffmann Bearings Corporation
Stamford, Conn.

Booth 1408, Annex

In attendance

D. E. CHRISTOPHER, Chicago sales representative
WARREN ANDERSON, engineering department

Exhibiting a complete line of precision ball, roller and thrust bearings, featuring its cartridge type self-sealed single-row ball bearings, particularly adaptable for application to electrical equipment, including motors and generators where economy and mounting practice is afforded, together with approved operating characteristics. Also, a complete line of extra light series ball and roller bearings, particularly adaptable to clutches, clutch sprockets and idler gears, where space limitations are paramount, economy and space being afforded by the extra large sizes of bores available with minimum outside diameters.

There will also be displayed a complete line of cylindrical roller bearings, single-row and self-aligning ball bearings adaptable to a wide variety of applications on oil-field equipment; a number of types and sizes of ball and roller bearing pillow blocks, and smaller sizes of bearings, many equipped with single and double seals suitable for instrument work.

Norvell-Wilder Supply Company
Beaumont, Tex.

Booths 104, 106, 108, 110, 112, 114, 116, 118, 120, 205, 207, 209, 211, 213, 215, 217, 219, 221, Coliseum

In attendance

Representatives from all of the eight Norvell-Wilder stores and two offices will be present at various times. The Norvell-Wilder section is one of the largest in the oil show. Ample provision is made for the convenience of guests.

Oakite Products, Inc.
New York

Booths 1308, 1310, Annex

In attendance

GEORGE SEIB, New York
J. C. LEONARD, Chicago and southwestern division manager
A. W. SCHULTE, Dallas representative
WILLIAM A. DOWEN, Houston representative
J. R. WHYTE, Tulsa and Oklahoma City representative

One highlight will be a miniature cutaway model of a storage tank illustrating paint stripping of exterior surfaces safely before reconditioning by the patented Oakite hot flow-on method, and cleaning interior surfaces.

Dramatic picturization will also be employed to direct attention to new and improved methods and materials designed to increase operating efficiency and maintenance of Diesel engines, air compressors, oil coolers, preheaters and similar heat exchange equipment through the removal of hard water scale and rust accumulations and carbonaceous oil and grease deposits.

Oceanic Engineering Works
Houston, Tex.

Booth 1008-A, outside

In attendance

ECO HUTCHISON — LEON HART
JACKLYN FOSTER — F. E. HUTCHISON

Showing new type of vibrating screen for reconditioning drilling mud, stated by the company to be unique in that it is installed in the flum or the flow of the mud between pits. The returns from the well

flow into a pit in front of the screen, giving the solids a change to settle by gravity—those that do not settle float up to the screen cloth where they are carried to the bottom of the screen that is set at an angle—the vibrations (1,800 r.p.m.) are such as to convey material downward leaving the screen open for the mud to flow through. As a static pressure can be held on the front of the screen cloth it is possible to use very fine-mesh screening cloths, that not only separte the sand but degas the mud flowing through it. As gravity first acts on the solids and they float up to the screen cloth against gravity their force is so broken that they are not hurled into the screen mesh to blind the cloth.

O. C. S. Mfg. Company
Coffeyville, Kans.

Booths 1413, 1415, Annex

In attendance

D. R. BROWN — D. C. MYERS
C. B. MORTON — A. G. EVANS-LOMBE
FRED STANLEY — R. J. HANSEN
BEN PALAMOUNTAIN — TOM SCOTT
JOE KILCHENSTEIN — JACK ROSS
MELVIN L. DICK

The OCS 5 hp. double reduction pumping unit is a miniature of all OCS Polly type pumping units. It is identical in design with all parts machined with the same accuracy and the same quality as the larger sizes up to 100 hp. The one difference in principle is that it is provided with both a centrifugal and beam balance. This combination balance for a small size unit, it is stated, provides the unit with both the advantage of the centrifuge balance and the advantage of the beam balance. It also gives the added advantage of individual well operation. The efficiency of roller bearings and roller chain provides this unit with the highest efficiency of this type and assures low power cost, particularly when electric power is purchased.

Oil Center Tool Company, Inc.
Houston, Tex.

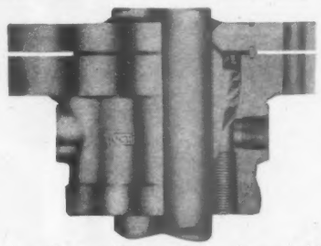
Booths 400, 401, 402, 1049, Coliseum

In attendance

A. J. PENICK, president
K. T. PENICK, secretary-treasurer
B. V. FISHER, vice president and sales manager
H. D. START, vice president
VAL R. WITTICH, foreign sales representative
PAUL BAIMBRIDGE, sales representative
WALTER BURKE, sales representative
C. J. HILLMAN, sales representative
C. K. MOUNT, sales representative
I. C. WELLS, sales representative
H. C. STEWART, sales representative
H. S. PERRY, sales representative
J. E. EDWARDS, sales representative

Exhibit will include blowout preventers, casingheads, bradenheads, tubing heads, adjustable and quick change chokes, high-pressure fittings, christmas trees, air-balanced pumping unit.

The Type C-9-PS casinghead is one of the several new heads which will be included in the exhibit. It permits, it is stated, landing casing at any desired point, and permits drilling and running casing through blowout preventer equipment flanged above. Packing, slips, and slip bowl pass through blowout preventer equipment. Packing is compressed by weight of casing. Hold-down screws aid in compressing packing.



Available with or without welding flange, which holds casing down and effects auxiliary seal above slips. Made in test pressures up to 10,000 pounds.

The Oil and Gas Journal
Tulsa, Okla.

Space 8, Coliseum

In attendance

P. C. LAUINGER — E. KLAPPENBACH
K. J. LANGLEY — C. LLOYD CAIN
HOWARD MARKT — C. R. FARMER
WAYNE RIVES — J. H. TINKHAM

Oil City Brass Works
Beaumont, Tex.

Booths 1236, 1238, Annex

In attendance

GEORGE E. BRYANT, JR., vice president
B. D. TODD, superintendent
L. H. KENNON, Houston manager
R. H. RATLIFF, sales representative
R. J. LOUCKS, sales representative
W. G. SANDERS, sales representative

Exhibit will be devoted to Red-Rex one-bolt pipe union, exclusive manufacturing rights to which this company secured in December of last year; to Bron-

Long-hub malleable union, 500 pounds WP/1,000-pound test

zoid, the concern's proprietary bearing bronze; and to steel forgings. Of principal interest will be the new line of malleable unions, and medium pressure steel unions developed since the first of this year. Malleable unions are displayed in both the "short hub" and "long hub" types, being unique in their field in that construction is identical with that of the higher pressure steel unions, also displayed. Seal rings are interchangeable, and are of the double-tapered positive sealing type, supplied in bronze or steel.

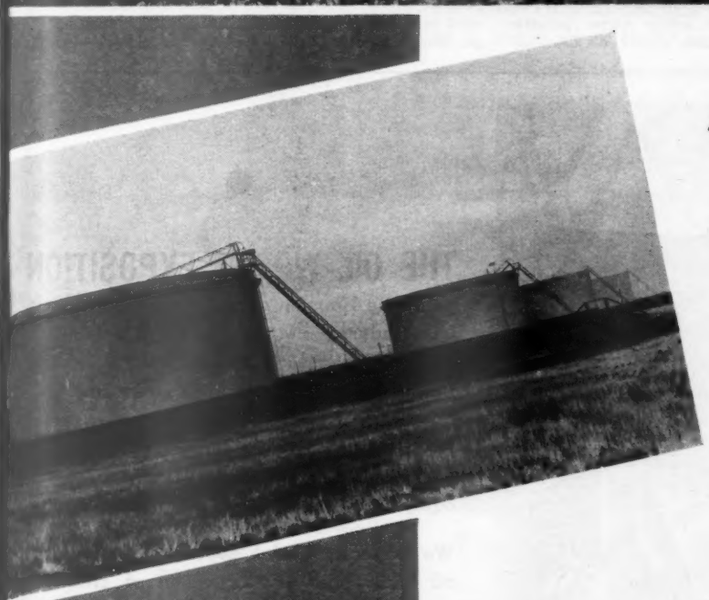
Oil Well Supply Company
Dallas, Tex.
(Gulf Coast District Headquarters, Houston, Tex.)

Booths 532, 534, 536, 538, 540, Coliseum

In attendance

Houston representatives

Products to be exhibited: Pictorial presentations of the design and application of modern oil-field machinery.



In every Important Oil Field···

Ready to serve . . . *and serving!*

The fine reputation of Pittsburgh-Des Moines Steel Storage Tanks has been earned over many years of conspicuous good service—out in the open, where P·DM quality of design, materials and workmanship becomes more obvious as the years roll by . . . where continuous use *increases* the user's satisfaction.

Economy of long life is combined in P·DM Tanks with low first cost. Two strategically-located plants, modern fabricating equipment and methods, plus the "know-how" of intensive experience make a P·DM quotation interesting.

Let us have your current problems!

PITTSBURGH · DES MOINES STEEL CO.

PITTSBURGH, PA. 3496 NEVILLE ISLAND — DES MOINES, IA. 997 TUTTLE ST.

NEW YORK, ROOM 980, 270 BROADWAY . . . CHICAGO, 1202 FIRST NATIONAL BANK BUILDING

DALLAS, 1201 PRAETORIAN BUILDING . . . SAN FRANCISCO, 603 RIALTO BUILDING

Oil Field Insulation Service Co.
Houston, Tex.

Space 1590, Annex

Oilfield Machine & Supply Co., representing Tuboscope Internal Tubular Inspection Service, Ventura, Calif.
Houston, Tex.

Booth 1065-A, outside

In attendance

FRITZ HUNTSINGER E. K. LANE
W. H. HOPKINS M. M. VERHEUL
D. P. TARPENNING

Principal exhibit, the "Tuboscope," a device which enables the operator to visually inspect the internal walls of tubular goods. Complete demonstrations of the device and the service offered will be given as well as a short colored motion picture of the service.

Olympic Products Company
Los Angeles, Calif., and Houston, Tex.

Booth 254, Coliseum

In attendance

R. R. RENOUF R. V. STOUT

Exhibiting Olympic packers, liner hangers, tubing anchors, equalizing guides, line guides (spoolers), automatic by-pass valves for packers and gas lift, rubber thread protectors and molded rubber products. All products manufactured and stocks carried at Los Angeles, Calif., and Houston, Tex.

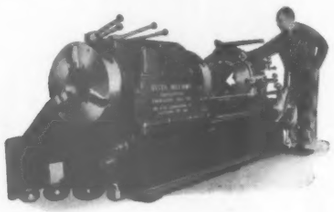
Oster Manufacturing Company
Cleveland, Ohio

Booths 716, 718, 720, 722, Coliseum

In attendance

A. S. GOULD, vice president
H. C. GARDNER, southwestern district manager
L. M. GARDNER, representative
P. E. WILLIS, representative
S. PIASCIK, assistant superintendent
HENRY ZUERL, machine operator

Exhibiting company's entire line of hand- and power-operated pipe and bolt threading machines, the feature being No. 8-XHD heavy-duty Rapiduction pipe



threading and bucking-up machine. This machine has a capacity covering all sizes up to 8⅝-inch O.D., and it is stated it is built from the ground up to withstand the terrific punishment to which it is subjected in bucking-up work.

Oshman Outdoor Store
Houston, Tex.

Booth 249, Coliseum

In attendance

C. L. KEITH G. B. "SKELLY" SKELTON
C. L. BERING J. S. OSHMAN

Otis Pressure Control, Inc.
Dallas, Tex.

Booths 1314, 1316, Annex

In attendance

I. A. MILLER L. M. WILHOIT

Will have the following Otis equipment on display: Snubbers, square kelly pressure control drilling unit, removable bottom-hole chokes, Type G (side door) removable bottom-hole choke, removable bottom-hole regulator, removable tubing safety valve, paraffin scrapers and tubing closing tools.

Henry H. Paris
Houston, Tex.

Spaces 650, 652, 654, Coliseum

Parkersburg Rig & Reel Co.
Parkersburg, W. Va.

Booths 1300 and 1303

In attendance

J. M. CRAWFORD C. A. RUF
P. L. BROOKS V. E. ASHFORD

Exhibit: Model pumping units.

Patterson-Ballagh Corp.
Los Angeles, Calif.

Spaces 132, 134, Coliseum

The Permutit Company
New York, N. Y.

Booth 1341, Coliseum

In attendance

J. A. ROSSITER J. P. JETER

Equipment shown will include our new portable Zeolite water softener rig for treating boiler waters for well drilling equipment. Literature and photo blowups will describe Zeo-Karb—the hydrogen zeolite treatment, Permutit cold and hot lime soda methods of water softening as well as chemical feeds, Floc-formers, and other new and improved devices. Also, on display will be the new automatic household softening unit.

Peerless Mfg. Co.
Dallas, Tex.

Space 1511, Annex

In attendance

E. W. SMITH

Will exhibit mist extractors and line separators, used in gasoline plants and refineries and on natural gas lines; gas well separators, used on high-pressure

ASSEMBLING HEAVY EQUIPMENT —from a lithograph by E. M. Schiwetz

THE OIL-WORLD EXPOSITION

points up Houston's importance to the petroleum industry, not only as a production and refining center, but also as a natural location for the manufacture of equipment and supplies. The First National in Houston serves the industry in all its departments and many of the manufacturers and distributors of the equipment you use.

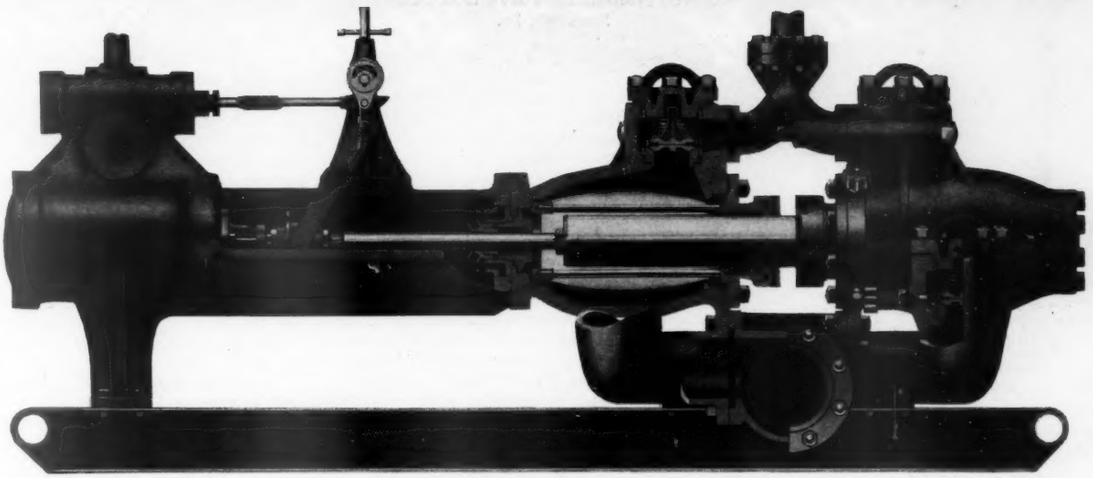
We have a special department to handle oil loans, and the extension of credit to sound enterprises is one of the services most valued by our customers in the oil industry. The officers in charge of this department will be glad to discuss your credit requirements at any time.

FIRST NATIONAL BANK
IN HOUSTON

MEMBER
FEDERAL DEPOSIT
INSURANCE CORPORATION

Make the FIRST NATIONAL your bank

DON'T MISS THESE at the Oil Show!

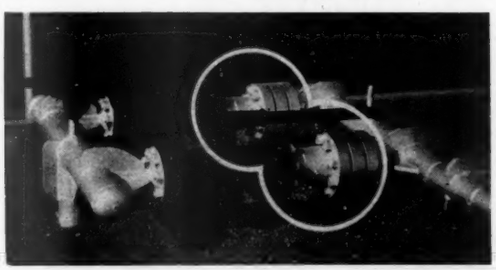


The FLUID-PISTON SLUSH PUMP

See the advantages of this revolutionary slush pump principle, proven by six years of hard field service to reduce pump operating costs to a fraction of their former amount . . . . the pump which uses no liners or pistons, which has no moving parts in contact with mud, with plungers and rods packed against clear water only . . . . and which offers many other valuable features available in no other slush pump.

The SHEAR-RELIEF VALVE

See the SHEAR-RELIEF Valve which protects pumps, manifolds, drilling hose, and flow line fittings against excess pump pressure by the shearing of a common nail, thereby reducing pump maintenance costs to a new low.



The CONOCO CHECK VALVE

See the CONOCO Check Valve for gas, air or steam in high pressure gasoline plants, pressure maintenance systems, gas recycling systems, high pressure gas field lines, etc. . . . . a proven safety measure against overloads.

The PRESSURE GAUGE

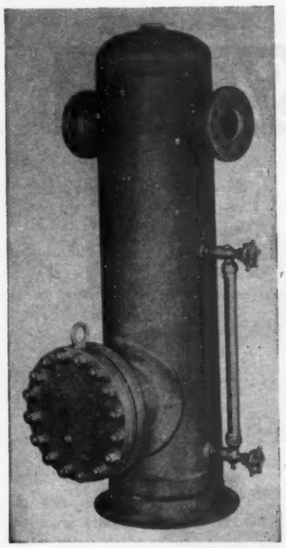
See the Abercrombie Pressure Gauge for mud, water, oil, air, gas, or any liquid . . . . the new but thoroughly proven gauge which has taken pressure gauges out of the delicate instrument class, which gives a uniform reading under all operating conditions.

FLUID-PISTON SLUSH PUMPS

ABERCROMBIE PUMP CO.

HOUSTON, TEXAS

gas wells making distillate or relatively small quantities of oil, and featuring a new weight-operated, internally mounted oil valve, with stellited valve and



seat; odorizers for odorizing natural gas lines, and Nicholson gasoline traps.

Payne Furnace & Supply Co.
Houston, Tex.

Space 1508, Annex

The Petroleum Electric Power Club
Houston, Tex.

Booths 9, 10, 11, Coliseum

In attendance

F. M. AUSTIN — O. W. JONES
E. L. ROBINSON — R. E. HENDRICKS
WALTER MOORE — K. K. KREAMER

Display of electric motors and associated apparatus used in petroleum industry.

The Petroleum Engineer
Dallas, Tex.

Spaces 218, 220, Coliseum

Petroleum Service Bureau
Tulsa, Okla.

Space 13, Coliseum

In attendance

DUDLEY W. MOORE, manager

Exhibiting mechanical books and publications of the Industrial Press, New York, also oil directories, mailing lists and Rotary Drilling Handbook.

Petroleum Tire & Supply
Houston, Tex.

Spaces 750, 752, Coliseum

Pettibone Mulliken Corporation
Chicago, Ill.

Booth 1584, Annex

In attendance

C. KENNETH SMULLEN, Fort Worth
E. J. SEIFERT
W. ENSTROM
J. P. MURTAUGH

Will show improved designs of manganese steel drilling and A.P.I. production sheaves, and application of PMCo diamond alloy. In these new sheaves the company states it has combined careful design and metallurgical experience with the idea of providing safety, long rope and sheave life inherent with the manganese steel sheave at costs permissible in view of present-day field practice.

Diamond alloy, a company development, is for applications requiring continued and extreme resistance to abrasion. It is stated to have a tensile strength of 75,000 p.s.i. and a Brinnel hardness of 670-700, a relative wear resistance of 12 to 1 against S.A.E. 3340 steel and 2½ to 1 against an alloy of 600-700 Brinnel composed of iron carbides and Martensite. The applications are slush pump liners swivel wash pipes, cores for well-head (blowout preventers) and ball seats.

Diamond alloy, it is said, has marked resistance to corrosion, not only at normal temperature but at continued high temperatures in extreme corrosive atmospheres, showing no growth and maintaining its hardness with many appalications in the refinery.

Pittsburgh Equitable Meter Company
Merco Nordstrom Valve Company
Pittsburgh, Pa.

Spaces 335-337, Coliseum

In attendance

A. J. KERR, district manager, Tulsa
L. A. BABIN, Houston, Tex.
E. P. MARTIN, Corpus Christi, Tex.
L. R. VAN ARSDALE, Tulsa

Products to be exhibited: Nordstrom lubricated plug valves; Stupakoff bottom-hole pressure gauge; Stupakoff bottom-hole sampler; Emco Type 38 forged steel orifice meters; Raybould fittings; gas regulators; water meters; oil and gasoline meters; Pittsburgh Rotocycle meter for oil pipe line measurement.

The Type 38 orifice meter has forged steel chambers and covers, the standard meter being tested for 1,500 pounds working pressure. Available in pressure ranges from a vacuum up to 4,000 pounds. It is quickly convertible from one pressure range to another.

The Rotocycle meter is described as an accurate, large capacity, positive displacement meter for pipe line measurement. Capacities ranging from 150 bbls. to 3,000 bbls. per hour. Maximum working pressure, 1,000 pounds. There are no reciprocating parts. It is self-cleaning.

The Raybould coupling is a pipe coupling for quickly and easily making pressure-tight, flexible connections on plain end pipe. No threading required. Only a wrench necessary. Full cathodic protection, every joint an electrical conductor. Raybould couplings are flexible and absorb all normal pipe movements.

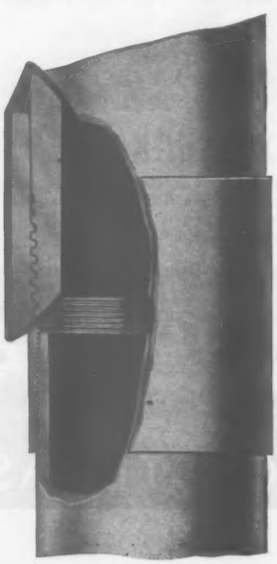
Pittsburgh Steel Company
Pittsburgh, Pa.

Spaces 1114, 1116, Annex

In attendance

A. S. VANDERVOORT, JR., district sales manager, Houston
S. E. ELDER, district sales manager, Tulsa
E. J. PROTIN, assistant manager, tube division
E. T. WIBLE, advertising manager
G. W. NOVAK, field engineer
W. B. BAYLOR, field engineer
JOHN WAIS, JR., field engineer
PAUL R. KING
R. G. McILROY

Description of exhibit—Pittsburgh special Acme-thread double-seal casing is made with a six-pitch modified Acme-type thread, making the joint quick stabbing and fast running. The accurate design of the threads makes up into a perfect seal in the threads, and the design of the threads afford greater joint strength and resistance to pull-out. There is a land area beyond the threaded area on the pipe, and a mating counterbore in the coupling, affording added contact in this gripping shoulder which gives support to the last engaged thread and provides an added shoulder seal.



A feature of the exhibit is an operating model hydrostatic test bench displaying the company's new and exclusive method of testing casing at the mill in tension. This miniature model hydrostatic tension testing bench follows closely in design the actual production equipment at the company's mill. The model is in actual operation, applying high-pressure testing to regular A.P.I. tubes.

Plomb Tool Co.
Los Angeles, Calif.

Booths 1570, 1572, Annex

In attendance

DON V. SCOFIELD — RAY C. RICKE
A. A. FREUND

The company announced it will display the very latest, quality hand tools for the oil industry. Representatives will be able to solve all problems relating to tools. A massive display board, 6 feet wide by 20 feet long, will contain such items as box wrenches, spud box wrenches, end wrenches, sockets and attachments, ratchets, screwdrivers, cold chisels, pry bars, punches, and over a thousand different items in quality hand tools.

Portable Rig Company, Inc.
Houston, Tex.

Booths 1043 and 1044, Outside Coliseum

In attendance

L. E. HODGES — W. S. LIGHTBOURN
L. D. CAIN — J. P. MORROW
J. L. KLUPPEL — F. A. CHANCE
O. D. SMALL — F. H. DALLING
T. P. BILBO — V. R. WITTICH, JR.
H. D. ROBINSON — F. J. JOBST
C. B. KLUPPEL

Exhibiting three models of rigs: Model "35," for 3,000-foot drilling, with all the latest improvements. Model CT-5, an entirely new rig, with hydraulic clutch control, and improved shifting for faster operation. Model R-876-8A will be presented for the first time equipped with dynamatic clutches, a departure from the conventional type clutch, which eliminates clutch wear and insures a smooth flow of power and positive engagement. Power can be increased or decreased on drawworks without variation of engine speed.

The Wm. Powell Company
Cincinnati, Ohio

Spaces 331-333, Coliseum

In attendance

JAMES COOMBE, vice president and general manager
E. K. PIERCE, district representative
WILLIAM HEILIG

Exhibiting a complete line of bronze, iron, steel and malleable iron valves for oil-well and refinery service—these include gate, globe, angle, check, manifold and test gate valves and plug cocks. Large cast steel gate valve for motor operation is of particular interest. Designed to compensate for expansion of internal parts, opens and closes in nine seconds—much above that normally used in steam-power plant work. Frequency of operation is every five minutes, 24 hours per day. This type valve designed for polymerization plants operating at extremely high temperatures and minimum pressures.

Pratt & Whitney
(Division Niles-Bement-Pond Co.)
Hartford, Conn.

Spaces 1538, 1540, Annex

In attendance

R. E. LAFFLER — L. E. SCHULTZ
S. G. JOHNSON

Exhibiting thread gauges for A.P.I. casing, tubing, line pipe, drill pipe, sucker-rod and tool joints. Precision measuring equipment including measuring machine, supermicrometer, electrolimit comparators, size blocks and miscellaneous standard gauges; small tools, including reamers, taps, hobs and dies.

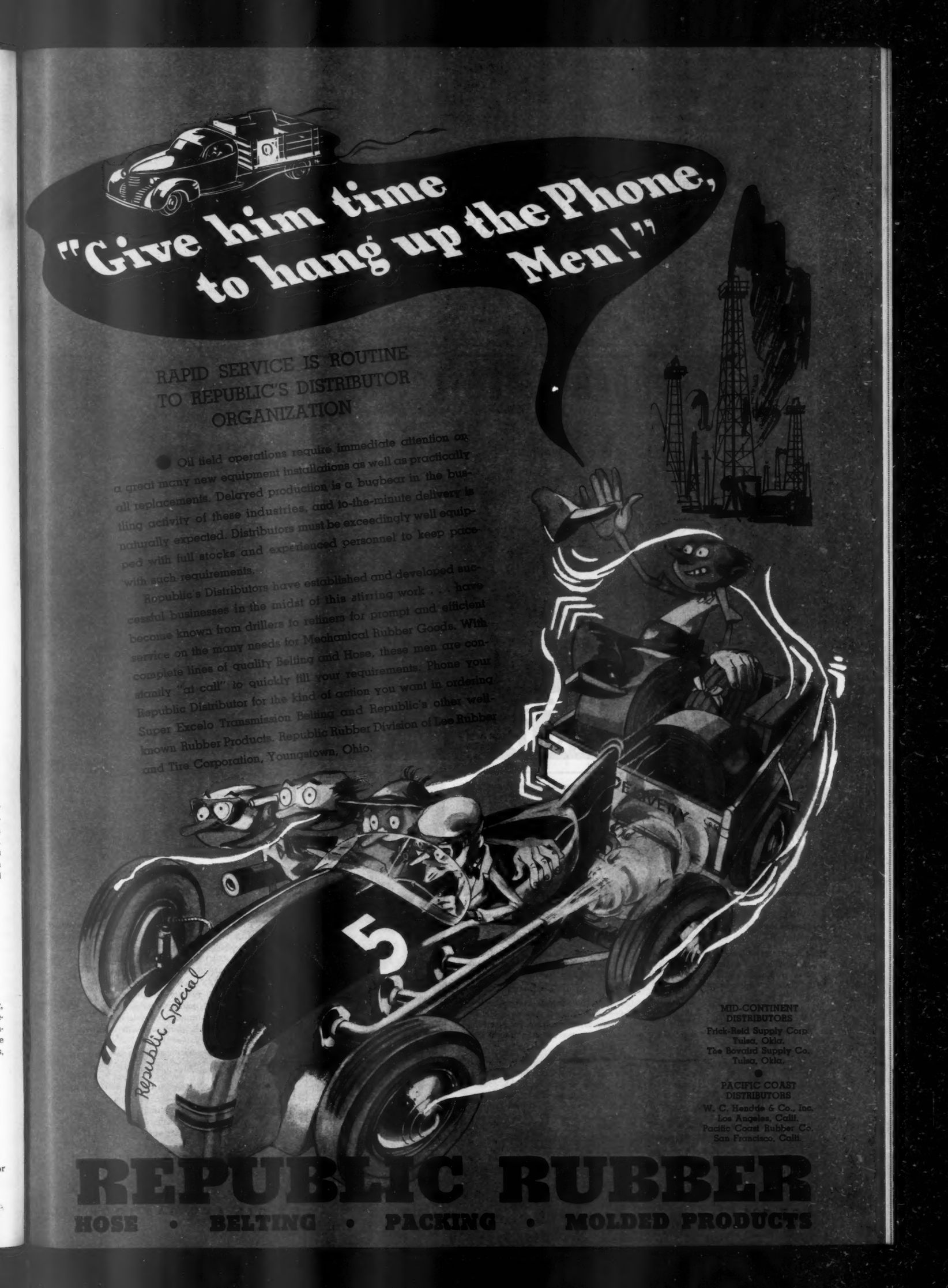
Productive Equipment Corp.
Chicago, Ill.

Booth 155, Coliseum

In attendance

L. E. SOLDAN, chief engineer
G. J. McLERNON, sales representative

Will exhibit the company's Mud Hog screen for screening rotary mud.


"Give him time to hang up the Phone, Men!"
RAPID SERVICE IS ROUTINE TO REPUBLIC'S DISTRIBUTOR ORGANIZATION
Oil field operations require immediate attention on a great many new equipment installations as well as practically all replacements. Delayed production is a bugbear in the bustling activity of these industries, and to-the-minute delivery is naturally expected. Distributors must be exceedingly well equipped with full stocks and experienced personnel to keep pace with such requirements.
Republic's Distributors have established and developed successful businesses in the midst of this stirring work . . . have become known from drillers to refiners for prompt and efficient service on the many needs for Mechanical Rubber Goods. With complete lines of quality Belting and Hose, these men are constantly "at call" to quickly fill your requirements. Phone your Republic Distributor for the kind of action you want in ordering Super Excelo Transmission Belting and Republic's other well-known Rubber Products. Republic Rubber Division of Lee Rubber and Tire Corporation, Youngstown, Ohio.
Republic Special
5
MID-CONTINENT DISTRIBUTORS
Frick-Reid Supply Corp.
Tulsa, Okla.
The Bovaird Supply Co.
Tulsa, Okla.
PACIFIC COAST DISTRIBUTORS
W. C. Hendrie & Co., Inc.
Los Angeles, Calif.
Pacific Coast Rubber Co.
San Francisco, Calif.
REPUBLIC RUBBER
HOSE • BELTING • PACKING • MOLDED PRODUCTS

Pruitt Spring Co.
Houston, Tex.

Space 1616, Coliseum

Pyrene Manufacturing Company
Newark, N. J.

Spaces 501, 503, Coliseum

In attendance

J. P. MALONEY, general field sales manager
W. L. FERRIER, Chicago district manager
B. S. ALLEN, sales representative
DAN BUTLER, sales representative
B. F. COVINGTON, sales representative

Several new or improved fire extinguishers will be featured in addition to the standard line of Pyrene vaporizing, liquid, soda-acid, foam, antifreeze, and water type fire extinguishers—a complete line of Pyrene standard, extra-heavy and "double-duty" bar-reinforced tire chains, accessories and the Mogul tractor tire chain. Two seamless drawn shell extinguishers assuring greater strength, greater safety and better appearance, known as the Guardene soda-acid type and Phomene foam type extinguishers, will be shown for the first time.

J. P. Ratigan
Los Angeles, Calif.

Booth 1312, Annex

In attendance

J. P. RATIGAN — J. J. CAVE
L. W. HENSHAW — C. J. RATIGAN
G. M. SEYBOLD

Exhibiting its regular pumping equipment, such as polish rod grips, oil-less beam hangers, walking beam rockers, pitman stirrup rockers, tubing tongs, sucker-rod wrenches, sucker-rod elevators, sucker-rod hangers, "C" and swivel links, bell nipples, sucker-rod hooks, rod line weights, shock absorbers, tubing block clamps, stringing up links, stuffing box clamp.

In addition to tools of recent manufacture and design, No. 152 equalizing tubing tong was designed to wrap around the tubing with greater efficiency. No. 144 combination bell nipple is a rod wiper, or rod stripper, has a shock absorbing feature, bell nipple feature, a packing-off feature. No. 142 stringing-up link, with a babbitt socket and a body composing its two parts with many practical uses in the oil fields, or where steel cables are used in connection with hoisting blocks. The pivotal bail can be connected to a dead man, or the becket of the block. The babbitt socket will accommodate any size up to and including 1⅛-inch cable.

Rector Well Equipment Company, Inc.
Fort Worth, Texas

Booth 12, in main lobby just northwest of The Oil and Gas Journal booth

In attendance

L. D. HILTON — W. P. KNIGHT
C. L. CRON — PAUL E. BAIMBRIDGE
E. W. BROCKMAN — M. L. JACKSON
L. L. RECTOR

Will exhibit two new types of bradenheads and tubingheads, both of which are entirely new to the company except for the trial installation. Also will display information regarding Rectorseal and Rectorkote, Rectorseal having been placed on the market about a year ago. Rectorkote has been on trial, coating tanks in West Texas to eliminate corrosion from dilute acids. It is also used in many places where salt water corrosion has given a great deal of trouble. Pictures and pieces of steel affected by corrosion which has been stopped by use of Rectorkote. Rectorkote has not been sold to date but the company states it has at least twenty batteries of tanks coated on the inside in West Texas as well as throughout Oklahoma, southern Louisiana, Kansas, and South and Southwest Texas, which experiments have been at the expense of the company in tests of this product.

Reda Pump Company
Bartlesville, Okla.

Spaces 1528, 1530, Annex

In attendance

A. ARUTUNOFF — P. E. LOYE
F. REES FLINT — J. O. WISE
J. LEE HILLIARD — BERT SUTTON, JR.
DALTON W. LAIN

Exhibiting Reda electrical centrifugal submergible oil well pump and operating equipment.

Regan Forge & Engineering Co.
San Pedro, Calif.

Spaces 404, 406, 505, 507, Coliseum

Reed Roller Bit Company
Houston, Tex.

Spaces 1012, 1007, Outside

In attendance

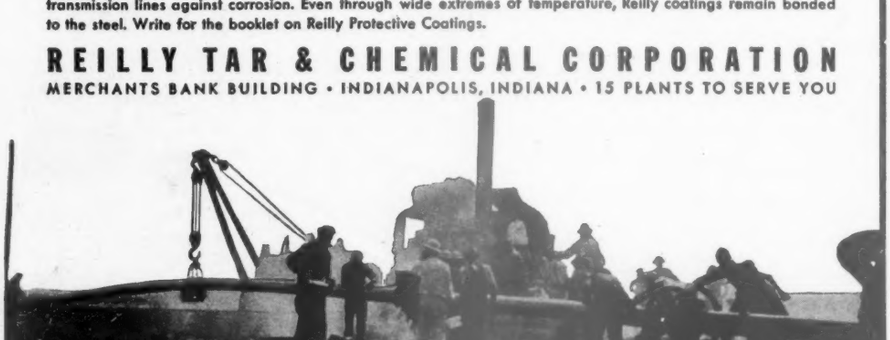
S. P. FARISH, president
W. L. CHILDS, vice president and general manager
R. G. HAMAKER, vice president and sales manager
L. T. ANDERSON, BR department manager
DR. J. V. PENNINGTON, works manager
GEORGE HARRINTON, chief engineer
T. J. STANCLIFF, assistant chief engineer
F. C. GIGNOUX, research engineer
C. J. FONTAINE, manager sales office
ALEX FEILD, pumping unit salesman
CHARLES PIRTLE, pumping unit salesman
C. F. JOHNSON, valve division
NATHAN JANCO, engine division
W. J. NUTTO, foreign representative (South American Rep.)
F. HAROLD GRAY, foreign representative (Europe)
JOHN ROBINSON, manager, Division 50
JOHN HOFFOSS, core drilling engineer
CREIGHTON STOKES, sales engineer
EDDIE CHILES, rock bit engineer
DR. ALEX VALLANCE, pumping unit division

Products to be exhibited: DK roller bits; wire line coring-drilling outfit, BR; WIB (welded-in) blade drilling bits; reamers; tool joints; back-pressure valves;

FOR DEPENDABLE PROTECTION

● REILLY PIPE ENAMEL and PRIMER gives completely dependable and permanent protection of oil and gas transmission lines against corrosion. Even through wide extremes of temperature, Reilly coatings remain bonded to the steel. Write for the booklet on Reilly Protective Coatings.

REILLY TAR & CHEMICAL CORPORATION
MERCHANTS BANK BUILDING • INDIANAPOLIS, INDIANA • 15 PLANTS TO SERVE YOU



Reilly PIPE ENAMEL AND PRIMER

Do you know ALL the advantages UPSET FORGINGS can give you?

IT WILL PAY you to be thoroughly informed on the reasons WHY leading equipment makers specify Upset Forgings for parts that are scheduled for hard service—WHY many equipment users insist on Upset parts for tough spots.

Most important of these reasons is that Upsetting improves quality by producing an ideal, dense grain structure. Especially, at points that must take the greatest strains. This means fewer failures in severe service, lowered maintenance and replacement costs.

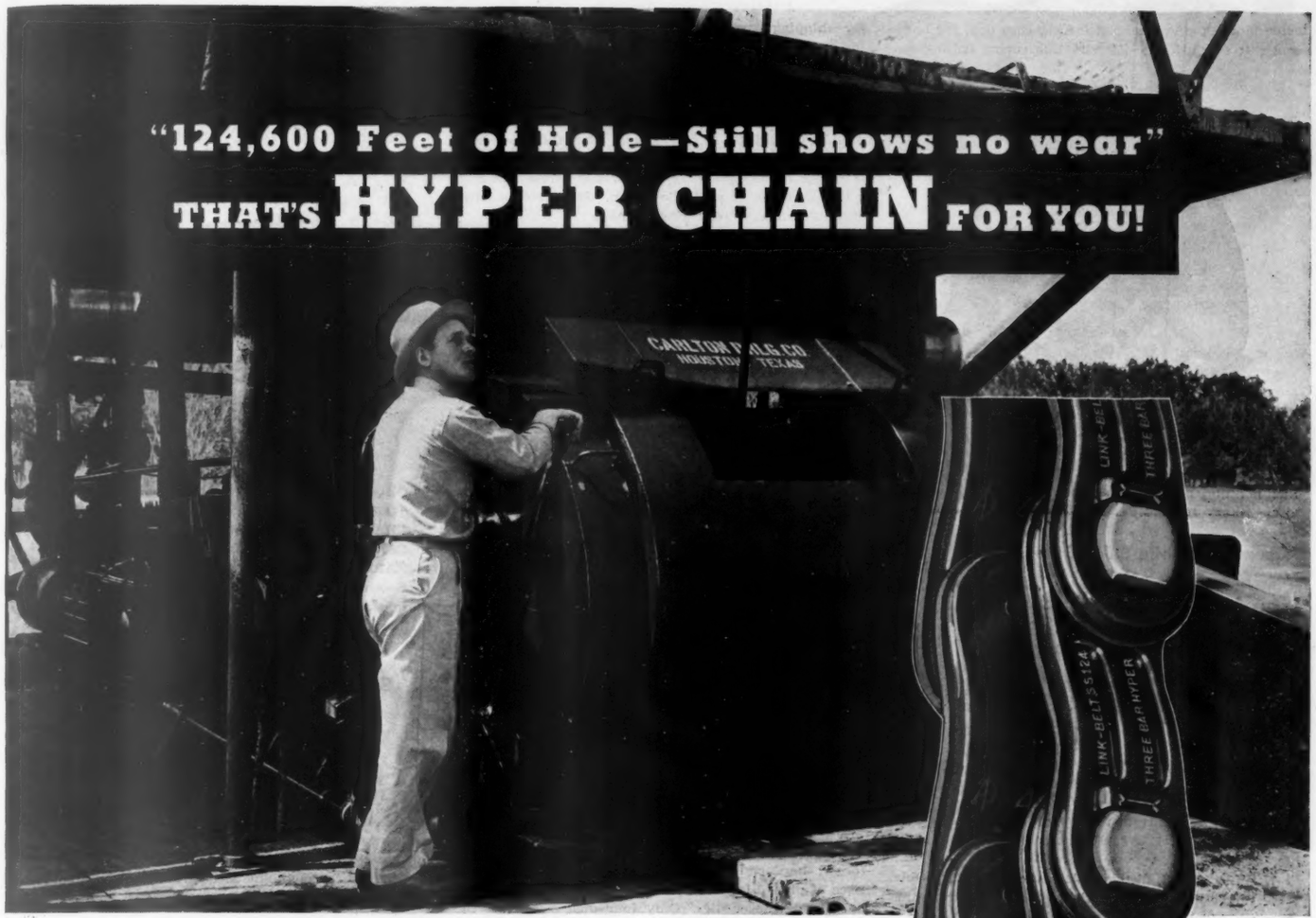
Another important reason for using Upset Forgings is their economy. Formed close to the contours of the finished part, they save steel—in some cases, up to 50% as compared to parts produced by other methods. And this saving in steel reduces freight and machining costs.

Let AmForge inspect samples or prints of parts you need; if they can be upset, you'll get a better product and possibly save three ways. Send the coupon below for a special bulletin on AmForge Forgings for oil field service. It will explain some of the advantages Upset Forgings offer you.

AMERICAN FORGE DIVISION
2621 South Hoyne Avenue . . . Chicago, Illinois

Please send me Bulletin 339
Name .....
Firm .....
Street .....
City .....
State .....

AMERICAN FORGE DIVISION
OF THE AMERICAN BRAKE SHOE AND FOUNDRY COMPANY
2621 SOUTH HOYNE AVENUE . . . CHICAGO, ILLINOIS



● From Jimmie Carlton, driller for Carlton Drilling Co., comes this interesting case history of Link-Belt Hyper Chain performance . . . just another of the many cases where Hyper continues to be the wise oil country chain investment. This rig, as pictured, is just finishing its thirteenth 6,850′ hole at Fairbanks, Texas. Before Fairbanks it drilled two 6,800′ wells at Hitchcock, following completion of four 5,500-footers at Magnet—a fast, continuous schedule of drilling. This total footage . . . 124,650 feet of hole . . . was drilled with the same SS-124 (3-Bar) Hyper Chain on all drives except the rotary, where SS-40 Hyper was used. The driller, himself, best describes the present condition of the chain when he says:"And I'm not about to replace any of it...that chain's not even showing any wear yet."

Link-Belt Company, Indianapolis, Houston, Dallas, Los Angeles, Philadelphia, Chicago, New York. Distributors in all fields. 7740

1939
NEW YORK WORLD'S FAIR EXHIBITOR METALS BLDG.

●

See our EXHIBIT at the OILWORLD EXPOSITION, Houston, Spaces 416-18-20, April 24-28

LINK-BELT CHAINS

THE CHOICE OF EXPERIENCED DRILLERS

inside blowout preventers; Kor-King core drill for hard and soft formations; SIH wire line coring-drilling out-

fits; nonlubricated plug valves; air-balanced pumping units; rotary engines.

Republic Steel Corporation
Cleveland, Ohio

Spaces 125, 127, 129, 131, 133, 135, 137, 139 (Stage), Coliseum

In attendance

J. M. SCHLENDORF, assistant vice president in charge of sales

W. M. NECKERMAN, assistant vice president in charge of operations

N. W. FOY, general sales manager

J. E. HOLMES, manager of pipe sales

MANLEY B. BROWN, assistant manager of pipe sales

G. F. HESS, assistant manager of alloy steel sales

CHARLES W. EAST, district sales manager, Houston, Tex.

HOYLE JONES, district sales manager, Tulsa, Okla.

I. WHITEHOUSE, advertising and sales promotion manager, Steel & Tubes, Inc.

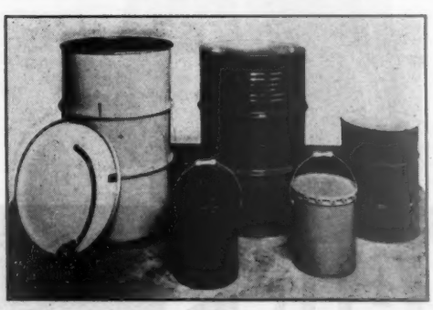
C. W. RUTH, assistant director of advertising.

The exhibit will include line pipe, casing and tubing sections. Display of Republic alloy steel products including rotary rock bits, fish-tail bits, tool joints, core barrel, slips, pump rods, elevator, tubing catcher and forgings. Display of Enduro stainless steel products including water well screen, valves and fittings, forgings and miscellaneous pieces. Sucker-rod display. Display of Upson bolts, nuts and studs. Display of fencing and other wire products. Display of Toncan iron sheets and roofing products. Display of cold-drawn shafting from Union Drawn Steel Division. Display of boiler tubes, mechanical tubing, stainless steel tubing and conduit from Steel & Tubes, Inc. Display of oil containers from Niles Steel Products Division.

Rheem Manufacturing Co.
Houston, Tex.

Space 1326, Annex

Displaying the company's steel drums and pails in various types, sizes and colors. The company fabricates grease and oil pails for the oil industry, painted



plain colors or beautifully lithographed in any designs desired by the customer. The larger steel drums are made in many types, sizes and gauges, the two principal types being the closed or tight head drum, commonly used by oil refineries for shipping lube oils and gasoline, and the full open-head drum, used for shipping greases. This package has a cover the same diameter as the body and is equipped with a suitable gasket and locking ring. The ring, which is the principal feature of this type drum, is so constructed to permit easy and rapid sealing. When the ring is locked there is no change for leakage of the product contained in the drum. The full open-head package is made in 15-, 30- and 55-gallon sizes. Paint is baked on the metal at the proper temperature in a thermostatically controlled oven. This gives a hard, durable and unusually glossy finish.

Rice Institute
Houston, Tex.

Spaces 1604, 1606, 1608, 1719, 1721, 1723, Coliseum

The Ridge Tool Company
Elyria, Ohio

Booths 644, 646, Coliseum

In attendance

W. L. PARCELL, sales manager

R. C. CHAMBERLAIN, sales representative

J. B. GRAHAM, sales representative

Presenting its complete line of pipe tools including the newest Rigid No. 65 R pipe threaders of rugged all-steel and malleable alloy construction, with drop-

forged hardened tool steel cam plates, thread four sizes of pipe, 1-inch, 1¼-inch, 1½-inch and 2-inch, with one set of chaser dies. Only four dies instead of the usual 16, and it is stated they stay in the threader, saving a great deal of time and bother. These Rigids offer a choice of two speedy mistake-proof workholders, a cam and a plate type, both practically automatic—set to pipe size, tighten one screw; no bushings. Workholders take 2-inch couplings for threading 2-inch close nipples. Closed chaser slots on die face will not stretch. Flip of thumb lever reverses ratchet and opens chasers for safe backing off. Chaser dies of semihigh-speed tool steel are accurately cut, long wearing.

Rodgers Hydraulic Incorporated
Minneapolis, Minn.

Booths 1404, 1406, 1507, 1505, Annex

In attendance

J. S. RODGERS, chief engineer

G. A. RODGERS, vice president

J. G. MURPHY, sales manager

Will exhibit new portable hydraulic press equipment which should be of interest to all operators and especially those who have to do with heavier operations such as drilling. The equipment is available in sizes ranging from 50 tons capacity up, either hand-operated or power-driven. The hydraulic press units are portable, can be used in any position, can be easily dismantled and assembled around the job in the field. The cylinder with pump may also be moved from frame for use as a jack or for driving tile or pipe.

Roller Bearing Co. of America
Trenton, N. J.

Booth 1556, Annex

In attendance

RAYMOND E. TRAINER, president

E. C. GAINSBORG, sales manager

GEORGE J. FIX, SR., representative in Texas

GEORGE J. FIX, JR., representative in Texas

Exhibit will consist of a background with large photographs illustrating cross section of the company's latest development needle type bearing marketed under the trade name of Cyclops bearing.

Also sample bearings, rollers and race sections of standard 20th Century and R.B.C. type bearings.

Walter Ruska & Co., Inc.
Houston, Tex.

Booths 141-A, 141-D, on stage, Coliseum

In attendance

W. E. A. RUSKA, president

MRS. HELEN GREENING, secretary

MRS. W. A. GARDNER

The following products will be on display: Amplifiers, bottom-hole samplers, flowmeters, galvanometers, mercury pumps, microscopes, optics, surveying instruments, permeability instruments, porosity instruments, precision chokes, flow beans, oscillographs, seismographs, recorders, radio equipment.

The Sabine Supply Co.
Orange, Tex.

Booth 1137, Annex

In attendance

B. F. BROWN, president

GROVER COLBURN, vice president

TOMMY HUGHES, vice president

FRANK SCOTT, salesman

CARROLL GRAHAM, salesman

EARL BAKER, field service

Booth will be made up of exhibits done in photomural. All operations and materials will be presented in pictures. The idea in the booth is for a visit or to rest and relax.

Safety Equipment Service Company
Cleveland, Ohio

Booth 529, Coliseum

In attendance

B. W. NUTT, president

F. C. BLAKE, field representative

Showing complete line of safety equipment for the prevention of accidents to workmen. This line will include goggles for chippers, grinders, welders and all other purposes, helmets, hoods for welders, respirators, gas masks; safety clothing, gloves, leggings and aprons made from asbestos chrome leather, fireproof material and rubberized material. Will also show various types of guards, ladder shoes, fuse pullers, first aid supplies, and safety and danger signs.

Scintilla Magneto Division and Zenith Carburetor Division of Bendix Aviation Corporation
Sidney, N. Y.

Booths 143-145, Coliseum

In attendance

Scintilla representatives:

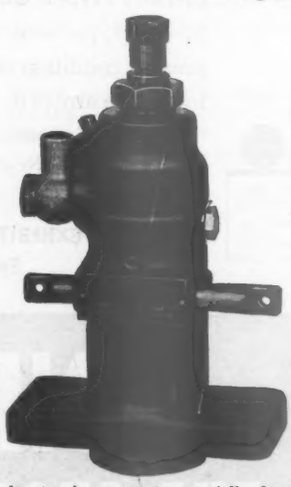
A. J. POOLE, sales engineer

CARL SORENSEN, sales engineer

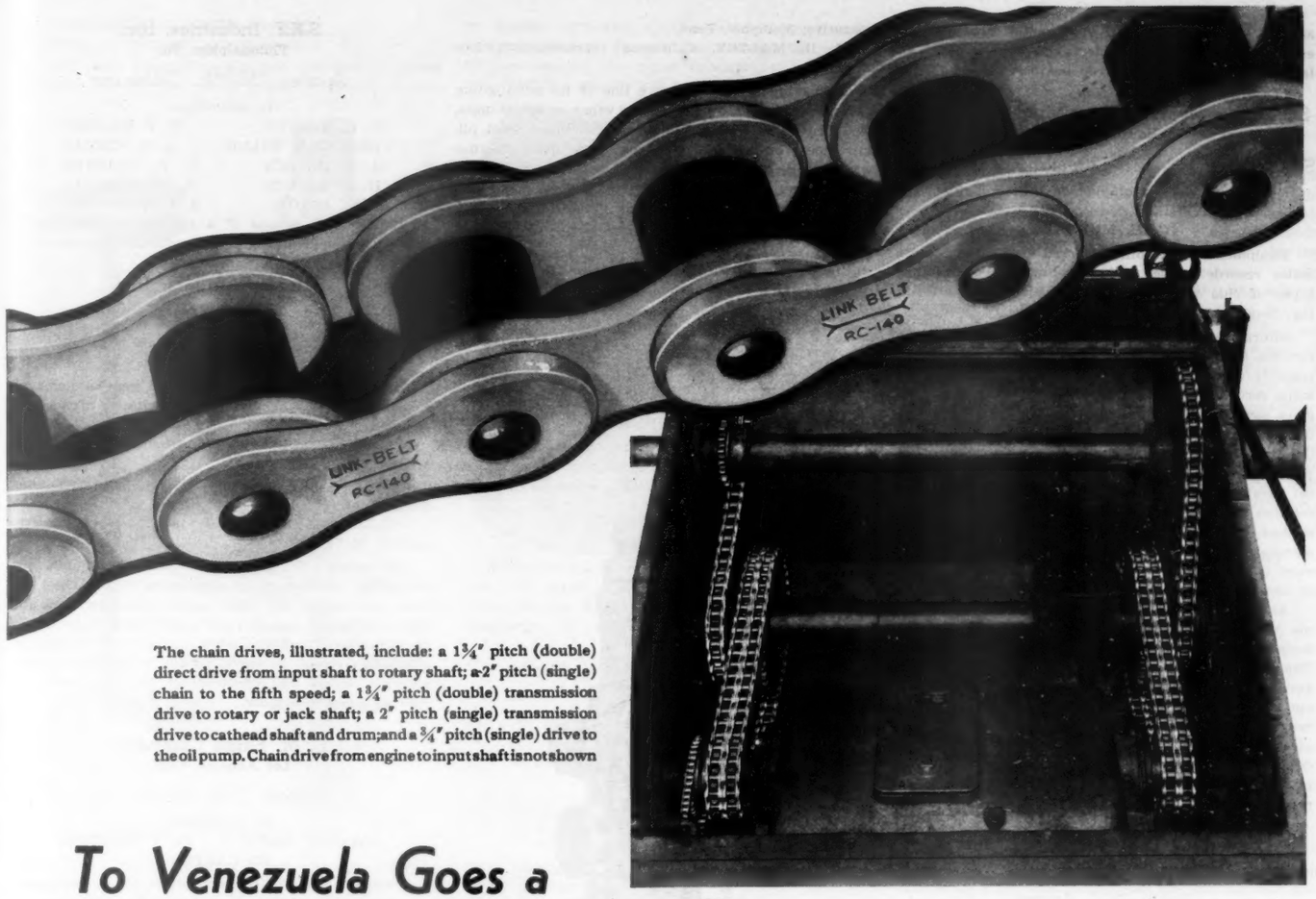
J. T. LANSING, sales engineer

A. T. BREMSER, fuel injection equipment engineer

In addition to the line of high tension magnetos, the company will make an initial showing of two new

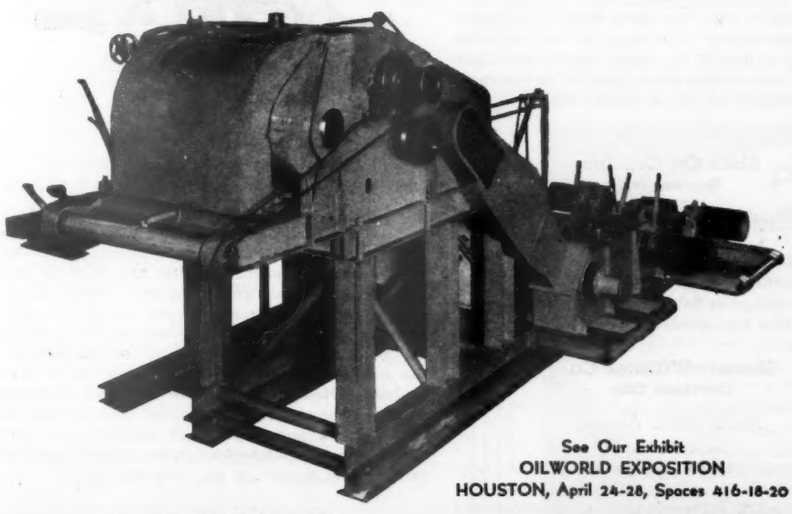


products, low-tension magnetos specially developed for oil field use and fuel injection equipment for self-ignition engines. Bendix low-tension ignition systems



The chain drives, illustrated, include: a 1¾" pitch (double) direct drive from input shaft to rotary shaft; a 2" pitch (single) chain to the fifth speed; a 1¾" pitch (double) transmission drive to rotary or jack shaft; a 2" pitch (single) transmission drive to cathead shaft and drum; and a ¾" pitch (single) drive to the oil pump. Chain drive from engine to input shaft is not shown

To Venezuela Goes a **PORTABLE CT-5 RIG** *Equipped with* **LINK-BELT SILVERLINK Chain**



● Portable Rig Company's Model CT-5 Mechanical Rig, pictured at left has recently arrived in Venezuela...the answer to a drilling program involving a series of important locations calling for continuous, speedy development. It is designed and built for 5,000 ft. drilling, and an outstanding advantage it offers is speed. The speed selection of this rig gives the operator a single line travel range from 270 feet per minute in low to 2,000 feet per minute in high-high. Such speed calls for the best in chain, and this rig is equipped 100% with Link-Belt Silverlink finished steel roller chain and sprockets. Dependable performance in extremely hard service in numerous oil countries has definitely established this preference for Link-Belt Silverlink in the roller chain field.

See Our Exhibit
OILWORLD EXPOSITION
HOUSTON, April 24-28, Spaces 416-18-20

LINK-BELT COMPANY
Indianapolis Dallas Houston Los Angeles
Philadelphia Chicago New York 7731

LINK-BELT *Silverlink* ROLLER CHAINS

are not modified automotive magnetos but are new equipment developed to meet the requirements of large stationary and industrial engines.

Schlumberger Well Surveying Corporation
Houston, Tex.

Spaces 117, 119, 121, 123, stage of Coliseum

In attendance

J. L. MATHIEU — W. A. CLARK
G. H. MURRAY

Equipment on exhibit: Electrical well logging, automatic recorder; side wall sampling, three different types of side wall samplers; precision gun perforating, two different types of guns.

Information will be available on Multielectrode recording, a new development in electrical logging made possible with the introduction, both of a new automatic recorder and a new technique. This new method gives several resistivity logs with increased depths of investigation, allowing the resistivity readings to reach the true fluid contained in the formation behind that portion invaded by the water from the mud. Electrical logging was formerly valuable primarily for correlation and was of considerable help in subsurface studies. It has now become a tool, thanks to multielectrode recording, which, it is stated, can make a very good differentiation between oil and salt water in nearly all cases.

Another interesting feature will be side wall sample taking. During 1938 a new technique was perfected for taking side wall samples in a drill hole. This method consists of lowering the sample taker gun into the hole by the standard Schlumberger cable and firing into the formation hollow bullets which remain attached to the gun. In this manner the samples are brought back to the surface with the gun. Great accuracy in sample taker placement is obtained by attaching an electrode to the sample taker and recording a new electrical diagram of that section.

Security Engineering Co., Inc.
Houston, Tex.

Booth 1213, Annex

In attendance

W. E. SIEVERS, vice president
AL FARROW, sales manager
H. S. SUTTON, division manager, Houston
L. G. ROBINSON, assistant manager, Houston (in charge of booth)

Will feature complete line of oil tools manufactured from "Securaloy," the drillable oil field metal, and will include several new tools just recently introduced. The exhibit will center around "Securaloy," with even the supporting columns of the booth composed of the product. The booth will be modernistic and decorated in blue, silver and white.

Models of "Securaloy" products and accessories will be shown in full size, with sections cut away to illustrate construction and operation. The entire line of "Securaloy" perforated screen pipe will also be on display, as will sections of the drillable pipe showing perforations made by both the gun and mechanical method. A special feature will be the showing of the various manufacturer's canvas wrapped packers made of "Securaloy."

The Sievers reamer will be exhibited in the Wilson Supply Co. booth.

Service Pattern & Model Works
Houston, Tex.

Space 413, Coliseum

Shafer Bearing Corporation
Chicago, Ill.

Spaces 1514, 1516, Annex

In attendance

R. B. HOOVER, president
M. J. TENNES, JR., vice president
J. DAN MALONE, sales manager
A. H. WILLIAMS, chief engineer
E. H. VERRALL, advertising manager
GEORGE J. FIX, SR., Texas and Oklahoma representative, Dallas, Tex.
GEORGE J. FIX, JR., Texas and Oklahoma representative, Dallas, Tex.
A. S. KENNEDY, Kansas and Nebraska representative, Kansas City, Mo.
J. H. SPRENGER, Louisiana and Tennessee representative, Memphis, Tenn.
E. D. MALTBY, California representative, Los Angeles

Displaying a representative line of its self-aligning roller bearings, pillow blocks and other mounted units. One feature will be a 7-inch electric-welded steel pillow block for use on heavy-duty drawworks. Another will be a bent shaft display consisting of a shaft with a 1½-degree bend mounted in two pillow blocks and revolving at slow speed. This illustrates the self-aligning action of the bearings and seals.

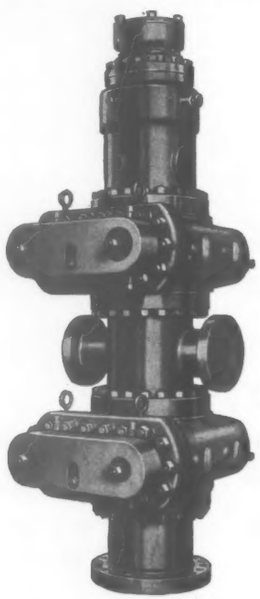
Shaffer Tool Works
Houston, Tex.

Booths 317-321, Coliseum

In attendance

W. D. SHAFFER — CARL W. VOGT
JOHN H. MORAN — BEN J. ROSS
S. R. SETSER — C. E. GEDDES
CLAY JOHNSON

Exhibiting its latest type blowout preventer equipment including its 10¾-inch, 10,000-pound test; also its 13⅝-inch, 6,000-pound test cellar control gates. These



will be equipped with the latest type self-centering rams. Will also display its 10,000-pound test kelly cock as well as its adjustable flow beans and its spool type casingheads, and various other items of high-pressure drilling equipment, as well as fishing tools, rod spacers, etc.

Shell Oil Co., Inc.
Houston, Tex.

Booths 1302, 1401, Annex

In attendance

D. HENDRICKS and other representatives from the Houston office.

Display will consist of a complete line of lubricants used in oil field equipment.

Sherwin-Williams Co.
Cleveland, Ohio

Booth 1331, Annex

In attendance

W. J. MONTGOMERY, general manager of transportation and petroleum sales, Cleveland, Ohio
BRYAN DAVIS, Texas manager, transportation and petroleum sales, Dallas, Tex.
J. R. STEVENSON, petroleum sales representative, Dallas, Tex.
E. L. RUMPH, petroleum sales representative, Houston, Tex.
JOE GEBHARDT, petroleum sales representative, Tulsa, Okla.

Showing a composite view of houses, tankcars, derricks, and other structures of the petroleum industry, in color and in relief against an ivory background, with a blue panel top showing the owner of the booth as the Sherwin-Williams Company, and it products—petroleum finishes.

S.K.F. Industries, Inc.
Philadelphia, Pa.

Spaces 756-758, Coliseum

In attendance

R. H. DeMOTT — F. E. ERICSON
ROBERT C. BYLER — A. H. SCHMAL
J. L. BRUSCA — W. F. WEIDNER
H. L. GADDIS — R. W. CARROLL
H. A. DIXON — A. KATZENBERG

Exhibit will consist of a complete line of S.K.F. ball and roller bearings and transmission appliances.

Skinner Purifiers, Inc.
Detroit, Mich.

Booth 1333, Annex

In attendance

PAUL WILLIAMS, president and general manager
J. M. RAVENNA, factory representative, Texas and Arkansas
C. B. SKINNER, factory representative, Louisiana, Mississippi
STACEY CAMPBELL, of C. B. Skinner Co., factory department
JULIAN P. VAN VORST, factory representative, portion of Texas

The exhibit is to include Super Filter units for continuous purification of lubricating oil in Diesel engines up to 700 hp. Also engine type purifiers for both lubricating and fuel oil, a unit for removing free and entrained moisture from air, as used in air circulating systems in large plants; a cutaway model showing design and construction of these units, as well as ample literature.

E. M. Smith Company
Los Angeles, Calif.

Booth 1122, Annex

In attendance

WALTER SMITH — PAUL KELTING
ED CARTER

Complete line of Grizzly products for oil-field service will be on display, including full-moulded rotary brake blocks; Powerflex, red line, and Cub rotary

hose; Giant drill pipe protectors; tubing protectors; unit pressure relief drill pipe protectors; "No-Wip" wire line saver; and the wire line turn back. Interesting to drilling crews will be the brake block band exchange plan, inaugurated by the company several years ago so operators may be assured of correct lining for drawworks as specified by the manufacturer; and also to insure perfect factory installation of lining on bands when reline jobs are necessary. According to the manufacturer, this exchange plan provides the operator with new bands for all types of drawworks, equipped with full-moulded brake blocks precision fitted at the factory, at no extra cost.

Howard Smith Company
Houston, Tex.

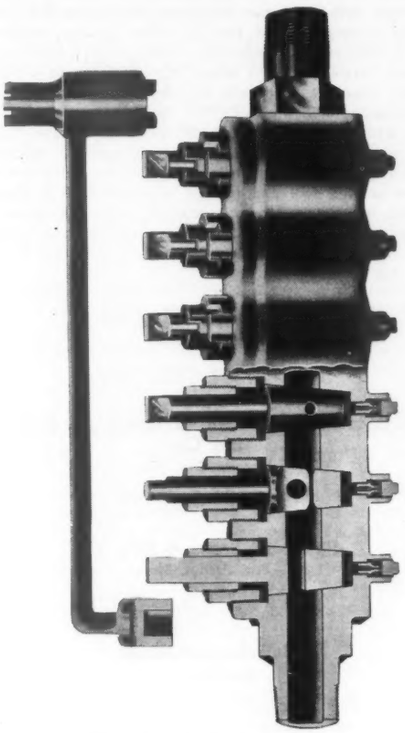
Booth 1107, Annex

In attendance

HOWARD F. SMITH, president
EDWARD BURNS, vice president
P. F. MATLOCK, sales manager
E. E. DAVIDSON, salesman
C. W. WOOD, salesman
C. MATLOCK, salesman
W. B. ROBINSON, salesman
A. R. MOONEY, salesman

CHARLES H. WILDER, salesman
HILL D. WILSON, superintendent

Will show Stancliff well screen, and Howard Smith variable chokes. The screen exhibit will have the various types manufactured with the different kinds of wrapping wire.



Howard Smith variable choke

The variable choke has six flow beans in series, each operated by a quarter turn of the stem. The first flow bean has the function of a valve. The other five have chokes of any selected sizes. This choke is tested to 8,000 pounds cold water pressure and is pressure-lubricated with grease through fittings at the bottom of each flow bean. This type of choke, when installed on high-pressure gas and distillate wells, or on oil wells having a high gas-oil ratio, tends, it is said, largely to eliminate freezing on the line when the chokes are set in successively increasing sizes.

A. O. Smith Corporation
Milwaukee, Wis.

Spaces 738, 740, Coliseum

In attendance

C. C. JOYS, JR., vice president in charge of sales
B. F. BART, sales manager, Gulf Coast Division
A. E. BUTTS, district sales manager, Tulsa
H. A. BOURNE, JR., district sales manager, Houston
STANLEY CARPE, Houston
R. FURRER, vice president in charge of engineering
W. R. KEPLER, chief engineer
T. M. JASPER, technical research consultant
J. DILOT, advertising manager

Displaying the company's High Yield casing.

Smith Meter Company
(Subsidiary A. O. Smith Corporation)
Milwaukee, Wis., and Los Angeles, Calif.

Booth 1562, Coliseum

In attendance

ALLAN A. FLOYD, president
E. F. ECKEL, chief sales engineer
C. E. VALENTINE, JR., regional sales manager
G. O. TATE, Tulsa district manager
T. M. PENNY, Denver district manager
R. N. WARD, Houston district manager

Will exhibit its complete line of refinery, pipe line, bulk plant, and tank-truck meters, in addition to its line of metering accessories. The refinery and pipe line group will include the new Smith high-pressure meters up to 6-inch sizes for 1,000 pounds working pressure, on display with and without automatic temperature correction devices. The new Smith Super Figure Counter incorporating the latest development in large direct reading numerals will be shown for the first time.

The latest models of Smith butane and propane meters will attract attention. The display will also include the new Smith Streamline valves, strainers, air eliminators, etc.

Smith Welding Equipment Corp.
Minneapolis, Minn.

Spaces 1586, 1588, Annex

In attendance

C. E. PORTER J. R. CLARK

SMITH'S Lifetime Guarantee as applied to oxy-acetylene welding and cutting equipment which, the company states, never need be replaced is featured.

The company's acetylene generators, which are approved by the Underwriters' Laboratories and the Factory Mutuals will also be displayed. A new day in regulator design is marked, it is stated, by the company's two-stage regulators. These will interest many who desire uniform flow of welding gases.

Of great interest to all welders is an unique five-year service guarantee as applied to the company's A. C. arc welders. These units feature ease of operation, economy and long life and have an unusual performance record.

The Sonner Burner Co.
Winfield, Kans.

Booths 1521, 1523, Annex

The company's "LV" air-cooled burner is a patented upshot type burner for low-pressure gas firing, of unit construction, and can be readily made up to fit any and all types of firebox boilers used in drilling and production work. The new burner is now being equipped with a spring type gas-actuated regulator for the control of secondary air. This type of regulator is quite sensitive and easily adjusted so the correct proportion of secondary air is constantly maintained, assuring the highest operating efficiencies at all stages of firing from low-fire to high-fire.

The company's Non-Freeze valve replaces the troublesome frost box and eliminates tank valve freeze-ups and costly tank connection troubles and delays. It is a long-barreled valve operated from outside the tank. The barrel is threaded and can be screwed into either a wooden or steel tank. The valve seat is protected by being on the inside end of the valve barrel, approximately 6 to 8 inches on the inside of the tank. Construction of the valve is heavy cast iron body with brass stem and standard replaceable valve seats.

Southern Engine & Pump Company
Houston, Tex.

Booth 1046, outside

In attendance

Southern Engine & Pump Co.:
D. N. WOMMACK W. G. PRICE
H. H. McGILVRAY RICHARD KROPP
LINN K. PARK WALTER A. PRICE

Le Roi Co.:
W. R. KARLL, sales manager
L. G. VALDES, Tulsa
P. W. EELLS, chief engineer
BOYD F. KOEPKE

Exhibit is a joint one in connection with Le Roi Co., Milwaukee, which it represents in Texas and Louisiana covering multiple-cylinder gas engines and electric generating sets. Equipment shown will comprise: 12-cylinder, 350-hp. Le Roi drilling engine equipped for operation on both natural gas and butane fuel; 6-cylinder, 175-hp. drilling engine equipped with combination natural gas-gasoline equipment; various sizes of special Le Roi pumping engines with complete equipment for combination natural gas-gasoline carburetion; 5-kw. Le Roi special electric light plant for oil-field service; 2-kw. electric light plant with combination gas-gasoline carburetion; Pomona geared head pump drive operated by Le Roi gas engine.

PROVED
on All Kinds of Mud Screening Jobs!
● For the lowest cost method of reconditioning rotary mud—use Link-Belt Screens. They have many exclusive features, such as fine mesh stainless steel screen cloth, rubber-cushioned; adjustable feed; enclosed vibrator unit; unitized collecting tank; self-contained drive, etc. Made in two sizes—24" x 48" and 48" x 60" screening areas. Send for Folder No. 1772.
Link-Belt Company, Philadelphia, Houston, Dallas, Los Angeles, Indianapolis, Chicago, New York. Sold by most supply houses. 7744-A
LINK-BELT Vibrating SCREEN

Southern Mill & Mfg. Co.
Tulsa, Okla.

Spaces 1524, 1526, Annex

In attendance

CARL H. AHRENS W. H. AHRENS
ROBERT E. AHRENS

Exhibit will consist of an end section of a Sturdybilt sectional house. It will be constructed in such a manner as to show all vertical and horizontal joints, and floor, roof and ceiling construction. One side of it will contain a Sturdybilt kitchen cabinet, which is standard in all of our oil field houses. There will be literature available showing that 4,000 of these Sturdybilt sectional houses have been built in 11 midwestern oil-producing states during the last 20 years.

Spang Chalfant, Inc.
Pittsburgh, Pa.

Booths 144, 146, 245, 247, Coliseum

In attendance

L. L. BRUNDRED R. M. BURK
H. G. TEXTER C. C. BRUSH
J. C. HARDCASTLE D. C. NEELY

Exhibiting samples of extreme line casing and shrink thread drill pipe and descriptive illustrations of its new C. W. (continuous weld) pipe and "Standard" seamless processing.

Speeder Machinery Corporation
Cedar Rapids, Iowa

Booth 1041-B, outside

In attendance

T. M. DEAL, president
B. O. EIGHMY, sales manager
HARRY MILLER, southwestern district representative

Exhibit presents the improved Model LS-40, a convertible full-revolving power shovel with performance qualifications especially advantageous in oil-field work. Speeder, a pioneer in the small shovel field, has engineered this machine to exceed the requirements of an ordinary three-eighths yard rated capacity, so that the LS-40 may be operated at full speed and full capacity under all conditions without fear of overloading. A traction speed of more than 3 m.p.h. assures essential mobility. To insure smooth, trouble-

free performance, genuine "Caterpillar" crawlers are standard equipment. These are available in either flat or grouser-type tracks, specially heat treated for hard usage. Exceptionally long crawlers provide sure footing on soft ground.

Sperry-Sun Well Surveying Company
Houston, Tex.

Booths 544, 546, Coliseum

In attendance

G. L. KOTHNY, vice president and general manager
R. L. MARSTON, regional manager
R. S. HYER, district manager
J. P. KLEP, sales engineer

Products to be exhibited: Syfo clinograph, H-K magnetic single shot, H-K inclinometer, Surwel gyroscopic clinograph, polar core orientation, magnetic orientation of directional drilling tools.

Of particular interest is the H-K magnetic inside single shot which can be lowered inside the drill pipe and extended below the bit when making readings for direction and inclination when using a removable core barrel, saving a round trip with the drill pipe. The instrument can also be used as an inclinometer inside the drill pipe.

The magnetic method of orienting drilling tools is obtained by the use of two small magnets inserted in a sub or drill collar in the same vertical plane as the drilling tool and making a record with a single shot instrument, the compass of which is opposite the magnets provided in the sub, obtaining a record of the direction at which the tool or whipstock is set in the hole.

Stahlman Lumber Co.
Houston, Tex.

Spaces 1304, 1306, Annex

Standard Asbestos Manufacturing & Insulating Co.
Kansas City, Mo.

Space 1135, Annex

Standard Brass & Mfg. Co.
Port Arthur, Tex.

Spaces 634, 636, Coliseum

Standco Industries
Houston, Tex.

Space 1568-A, Annex

Stewart & Stevenson
Houston, Tex.

Space 1068, Outside

PRODUCERS
TRANSPORTERS
MERCHANDISERS
OF
Crude Oil and Gas
in the
Gulf Coast
•
SOUTHERN MINERALS CORPORATION
SOUTHERN PIPE LINE CORPORATION
SOUTHERN CONDENSATE CORPORATION
SOUTHERN PHILLIPS CORPORATION
411 North Broadway
CORPUS CHRISTI -:- TEXAS
Cable Somico

Most OIL MEN
Prefer
This Completely
Air Conditioned Hotel

HERE you find a happy combination of all those qualities which make living worthwhile. Important is the fact that every room and every unit is air conditioned for constant comfort — summer and winter. This famous hotel is San Antonio's finest place in which to stop and stay.

PAUL McSWEEN
President

The ST. ANTHONY
SAN ANTONIO

L. S. Starrett Company
Athol, Mass.

Space 516, Coliseum
In attendance

W. J. CLARK, southwestern representative

Featuring its general line of precision tools, dial indicators, hacksaws, and steel tapes.

St. Louis Cordage Mills
St. Louis, Mo.

Booth 200, Coliseum
In attendance

HAROLD V. PATE, Galveston
R. S. NORRIS, southwestern sales manager
A. J. RESSEL, Galveston
E. E. FRIES

Products displayed follow: Amco "All-Weather" treated best manila rope, the brown rope with the outside green marker, wrapped in green burlap, a manila rope whose fibers are effectively treated against deterioration such as dry rot, etc.; American Superior manila rope for oil-field and marine purposes; Trojan best spinning lines; American Superior catlines and derrick lines. The American Superior manila catlines will be displayed on a turntable with spotlights.

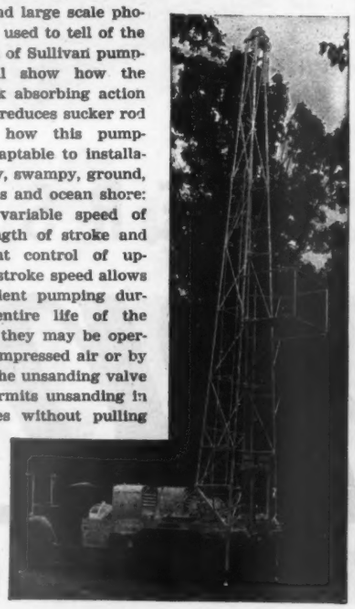
There also will be on display the company's new Super-wear drilling cable made of 12 lessoms, representing a marked improvement and a new construction in the manufacturing of manila drilling cable and it is developing outstanding service records because its extra three lessoms which give it much greater abrasive resistance. The company wants inspection of this new construction of manila drilling cable for which patent application has been made.

Sullivan Machinery Company
Michigan City, Ind., and Dallas, Tex.

Space 1023-A (corner of Walker and Bagby Avenue)
In attendance

J. W. HADDOCK, vice president
H. T. WALSH, vice president
J. A. NOYES, manager, oil field sales
J. B. MARTIN, manager, core drill division
P. D. CORNELIUS, oil field sales department
C. L. VAN DA GRIFF, salesman
J. E. M. SCHULTZ, salesman
WALTER A. KREVIS, salesman
G. E. SMEDBERG, Dallas sales
H. C. JOHANSEN, core drill engineer
H. H. VANDERZEE, core drill designer
W. H. WINEMAN, pumphead engineer

Will exhibit a complete working model of a Sullivan pumphead including derrick hanging equipment, pumphead, volume tanks, heater and compressor. The company announces that sketches and large scale photos will be used to tell of the advantages of Sullivan pumpheads; will show how the giant shock absorbing action materially reduces sucker rod breakage; how this pumphead is adaptable to installation on low, swampy, ground, flood plains and ocean shore: how the variable speed of stroke, length of stroke and independent control of up- and down-stroke speed allows most efficient pumping during the entire life of the well; how they may be operated by compressed air or by gas; how the unsanding valve feature permits unsanding in many cases without pulling the well; how single or multiple installation can be used; how wells can be weighted with a simple pressure gauge and without shutting down.



Sullivan No. 41 Drill

A Sullivan No. 41 core drill on a Marmon-Herrington truck will be displayed, introduced during the past year as a portable drill for electrical subsurface surveys, heavy structure testing work and shallow slim-hole production drilling. Field views and detail views will be used to show the company's No. 36 lightweight motorized shot hole drill, the No. 37 structure testing drill and the No. 51 portable deep structure testing and shallow production drill.

There will be a miniature of the new String-A-Lite vapor-proof derrick lighting sets.

The Sullivan Alleviator will be displayed in picture style.

C. J. Tagliabue Mfg. Co.
Brooklyn, N. Y.

(W. H. Curtin & Co.)
Booths 358, 360, 459, 461, Coliseum

In attendance

E. D. WACKER, general sales manager
R. M. WILHELM, division sales manager
A. G. KOENIG, district manager
L. VAN BLERKOM, division sales manager

(Continued on Page 246)

FOR OIL FINANCING... *it's*

First National, of Course!

DIRECTORS
B. F. BARNETT, Vice President
J. P. BYRD, JR., Vice President
M. M. DOAN, Oil Investments
F. L. DUNN, Executive Vice President
A. L. FARMER, Real Estate
H. N. GREIS, Oil Producer
C. A. KING, Vice President
JOHN D. MAYO, Mayo's, Incorporated
R. OTIS McCLINTOCK, President
F. B. PARRIOTT, Oil Producer
W. G. SKELLY, President, Skelly Oil Company
ELMO THOMPSON, Sunray Oil Corp.
GARY Y. VANDEVER, Vandever's

THE FIRST NATIONAL BANK AND TRUST COMPANY OF TULSA

1895

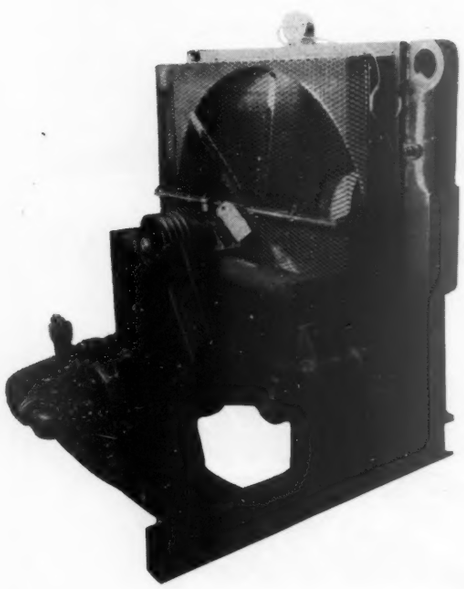
We Bank on OIL 1939

SEE HAPPY

YOUNG-HAPPY

Engine Jacket Water Cooler

ON DISPLAY



NEW IMPROVED DESIGN

The Latest Development in Engine Jacket Water Coolers

SLOW SPEED FAN

LOW HORSEPOWER

HIGH HEAD—HIGH CAPACITY PUMP

HIGH EFFICIENCY CROSS FLOW

CAST IRON HEADER TANKS

COPPER FINS & TUBES

MOST EFFICIENT TYPE CORE

ALL RATINGS GUARANTEED

On Display at Houston

No. 32 for 40 H. P. Engine

No. 232 for 500 H. P. Engine

Made in 12 sizes for 25 H.P. to 500 H.P.

Detailed information furnished on request. We will be pleased to recommend proper size Cooler upon information as to size engine or compressor to be cooled.

Specify HAPPY

FOR SERVICE

LEADERSHIP

Happy

310 EAST TENTH STREET TU

All Happy Belts are manufactured by the Boston Woven Hose and Rubber Company

AT HOUSTON OIL WORLD EXPOSITION

OUTSIDE SPACE 1022-A

TYPE T2-5 Happy Pumper

ON DISPLAY

T2-5 (5 H. P.) HAPPY PUMPER is the smallest of a series of chain driven double reduction Pumping Units which include 7½ H.P., 10 H.P., 15 H.P. and 20 H.P.

Single reduction Pumping Units sizes 15 H.P., 20 H.P., 30 H.P., 40 H.P. and 50 H.P.

All Happy Pumpers have cast iron chain reduction cases using Diamond Roller Chains and Timken Roller Bearings throughout.

Horsepower ratings being nominal, recommended horsepower loadings are much higher.

Happy Pumpers are backed by the 60 years' Engineering and Manufacturing experience of The Medart Company, St. Louis, Mo.

IN *19 years of Service*

BELTING COMPANY

TULSA, OKLAHOMA BRANCHES: Seminole, Oklahoma City, Oklahoma. Ellinwood, Wichita, Kansas. Odessa, Pampa, Texas. El Dorado, Arkansas. Salem, Illinois.

Patentees, owners and operators of the exclusive Continuous Vulcanization Process

A new Superspeed Celectray recording pyrometer designed to expose heretofore uncharted, but vital, temperature changes, operated to show how six different accurate temperature records can be made in 30 seconds. Another new Celectray pyrometer, Model No. V, of the indicating type, shown for the first time. It employs the Celectray principle, high sensitivity, photoelectric detection and split-second response—practically instantaneous control. While extremely sensitive to temperature change, it is not sensitive to vibration and does not require vibration-proof mountings.

Taylor Forge & Pipe Works
Chicago, Ill.

Booth 753, Coliseum

In attendance

PAUL R. BUSH

Exhibit will consist of complete line of Taylor forge seamless welding fittings, forged steel flanges, and the newly developed Centring Weldell.

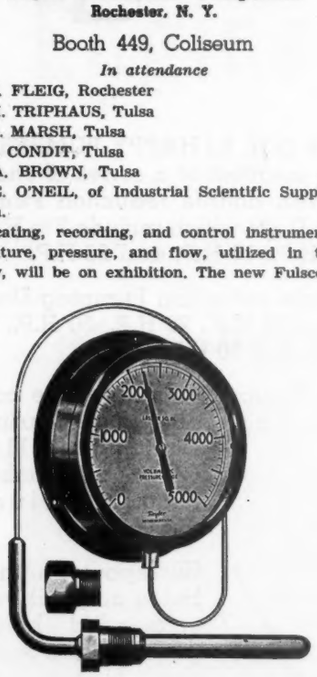
Taylor Instrument Companies
Rochester, N. Y.

Booth 449, Coliseum

In attendance

A. J. FLEIG, Rochester
E. H. TRIPHAUS, Tulsa
L. G. MARSH, Tulsa
D. J. CONDIT, Tulsa
H. A. BROWN, Tulsa
R. E. O'NEIL, of Industrial Scientific Supply Co., Houston.

Indicating, recording, and control instruments for temperature, pressure, and flow, utilized in the oil industry, will be on exhibition. The new Fulscope re-



cording controller will be the feature. Also shown will be indicating and recording pressure gauges for mud pump service, self-acting regulators for crude oil treatments, gold-shield etched stem thermometers for laboratory use, Permax hydrometers and Binoc industrial thremometers.

Technical Oil Tool Corp., Ltd.
Los Angeles, Calif.

Booth 228, Coliseum

In attendance

J. B. WOOD, president
J. V. ROBINSON, manager of field operations and equipment
E. G. McCONNELL, Mid-Continent manager

Products exhibited: Totco recorder for use in controlled vertical drilling and the go-devil. Equipment required for all methods for running it in both rotary and cable tool drilled wells. A technical display of precision engineering and construction work. A display explaining controlled vertical drilling methods and the results of their application will also be included.

During the past year the standard and heavy-duty go-devil equipment used for running the Totco recorder for controlled vertical drilling has been improved in the following respects: Hard chrome plating has been applied to both the inside surface of the go-devil container body and to the exterior surface of all of the attachments. This results in the elimination of corrosion and simplifies cleaning of the running equipment, as well as extending its service life by reducing the effects of abrasion while running through the drill pipe. All parts and connecting threads have been standardized, and are made by precision machining methods to insure complete interchangeability.

Templeton, Kenly & Co.
Chicago, Ill.

Space 312, Coliseum

In attendance

CHARLES, NEHER, Dallas, Tex.
J. B. TEMPLETON, vice president

The manufacturers announce the No. 310A emergency jack, which, in addition to maintaining the features of the No. 310, lifts 37 per cent easier, has a

1-inch greater lift, has a greater base area, eliminates stooping over as the base locking hook can now be foot-operated, has a more convenient carrying handle and longer and wider rack bar toe lift, a greater overload capacity and greater strength built into every detail.

The new simplified No. 440 Simplex heavy duty worm gear rod line jack has a fully enclosed geared mechanism and a speed crank for rod line slack tieup. The manufacturer claims it will pick up wells easily and quickly regardless of depth. Belt stretchers can be furnished with No. 440 as well as with No. 434 rod line jack which has a capacity of 3 tons.

Simplex adjustable boiler supports for quickly and easily setting up oil field boilers without timbering and shimming will also be exhibited for the first time.

No. 85A 5-ton single acting automatic raising and lowering jack which contains many important improvements over its predecessor, No. 85, will also be displayed.

Other jacks on exhibition are cable reel jacks, light and heavy duty riggers' jacks, journal jacks, ball-bearing screw jacks and the unusual Util-A-Tool which pushes, pulls, spreads, clamps, lifts and pulls open and closed faced wheels.

The Texas Company
Houston, Tex.

Spaces 712B, 714, Coliseum

In attendance

H. D. GOHLMAN will be in charge of the exhibit.

Exhibit will be a presentation of Texaco industrial lubricants.

Texas Electric Steel Casting Company

Booth 1131, Annex
Houston, Tex.

In attendance

F. M. WITTLINGER, secretary
C. K. THARP, metallurgist

Exhibit of macro and micrographic specimens of cast steel, pertinent facts concerning the company's product of interest to engineers.

Booths 432, 434, 436, Coliseum

In attendance

C. W. SHARTLE THOS. H. SHARTLE

This booth devoted entirely to service for other exhibitors. There will be three incoming phones, F-7378, and four long distance booths. Postal Telegraph will have a teletype machine and will be the only company sending messages direct from exposition. We will have 10 young ladies to run errands and deliver messages throughout the exposition grounds. If your home office wants you, have them phone F-7378 or wire Postal and we will make every effort to locate you at once.

Texas Foundries, Inc.
Lufkin, Tex.

Space 1325, Annex

In attendance

COL. CAL C. CHAMBERS HERMAN H. BRIEN
R. S. BRADSHAW, JR. MARTIN E. GORMAN

Exhibit is to introduce to the manufacturer of oil field equipment the first malleable iron foundry located in the Southwest. Castings of particular interest to the equipment manufacturer will be shown.

Texas Iron Works
Houston, Tex.

Booths 244, 246, 248, 345, 347, 349, Coliseum

In attendance:

L. M. PEARCE, vice president and general manager
WALTER CHURCH, chief engineer
S. P. VINNAGE, salesman
EDWIN GOODWIN, sales manager

Products exhibited: T-I-W bits, packers and setting tools, heaving shale drilling assemblies, safety joints, slips, tubing slips and spiders, compounding valves, back-pressure valves, kelly joint safety valves, lubricated grief stem safety valves, casing and tubing heads, and a general line of oil industry products.

The T-I-W lubricated grief stem safety valve is designed so that circulation is not restricted in any way; has straight core and sealing on both the upper and down-stream sides of body, eliminating the possibility of sand working between plug and body, thereby causing same to freeze. Lubrication assures positive operation in an emergency. This valve, it is stated, prevents blowouts through the drill stem which result in cutting up of expensive pieces of equipment such as swivel and hose—prevents fires—reduces danger to lives of crew. Streamlined so that catline will not hang upon valve stem, another safety feature that protects crew and equipment. The valve is manufactured from alloy steel, carefully heat-treated and machined.

Texas Pipe Bending Company
Houston, Tex.

Booth 148, Coliseum

In attendance

ALFRED S. BEELEY, owner
JAMES A. BEELEY
GEORGE E. DUCKWORTH
RAYMOND BEELEY

Display will consist of samples of work done in the company's plant; pipe bends, coils, and welded assemblies of carbon steel, alloy steel, stainless steel, copper, brass, aluminum, and wrought-iron pipe.

Texas Rubber & Specialty Co.
Houston, Tex.

Spaces 300, 301, Coliseum

Texasteam Co.
Houston, Tex.

Spaces 1405, 1409, 1411, Annex

Texasteel Manufacturing Company
Fort Worth, Tex.

Booths 412-414, Coliseum

In attendance

A. J. ARMSTRONG, vice president and general manager
G. W. ARMSTRONG, JR., vice president
R. C. ARMSTRONG, JR., sales, Fort Worth-Dallas division
J. F. FOSTER, secretary-treasurer
GOODSON RIEGER, sales, Southwest Texas division

The company is limiting its space to improvements effected on its "Electric Steel" sucker, pull, and polished rods. These will be shown in every stage of

(Continued on Page 250)

for the Oil Industry

Sucker Rods

THE following types of Bethlehem Sucker Rods have given outstanding service: Type XX, copper-bearing, is designed to handle difficult pumping loads where corrosion is not a particularly important factor. Type X, Mayari alloy of a patented nickel-chrome analysis, for heavy loads where corrosion is present. Both grades are fully normalized, and available in all standard sizes and types.

Sub Rods

Available in both XX and X grades, and in all required lengths.

Couplings

The Bethlehem standard coupling is a fully carburized, hardened, ground, and coated product. Threads are tapped after heat treating, thus avoiding distortion. Repeatedly inspected for A.P.I. tolerances. Where conditions do not warrant this high-grade coupling, a plain-steel coupling, not hardened, can be furnished.

Pull Rods

A.P.I. pulls rods of SAE 1040 carbon steel are carried in stock. Complete with drop-forged coupling. Rods in "as-rolled" condition or fully normalized. Special high-tensile or alloy rods can be made to order.

Seamless Products

Seamless Casing

BETHLEHEM Seamless Casing is available in grades B-40 and C-55 and in grade D-80 in long coupling only.

Types are A.P.I., Bethlehem BS-X or BS-8, and South Penn or Cushing. Bell-and-spigot or plain-end casing for welded strings can be furnished to chemical and physical properties as specified. All are made to exacting specifications and every length rigidly inspected by Moody Engineering Company, one of the country's most dependable inspectors of oil-field products.

Sizes range from $5\frac{1}{2}$-inch O.D. in grade B-40, or $4\frac{1}{2}$-inch O.D. in grade C-55, up to $8\frac{5}{8}$-inch O.D. in all grades. Larger sizes, up to $13\frac{3}{8}$-inch O.D., are available without delay.

Seamless Tubing

Bethlehem Seamless Tubing is made in grades B-40 and C-55. These are available to A.P.I. or BS specifications, either external upset or regular, and are inspected under the same rigid standards as Bethlehem Seamless Casing.

Sizes are $1\frac{1}{4}$-inch pipe size up to and including $4\frac{1}{2}$-inch O.D. in both grades, and upset or regular.

Wire Rope

BETHLEHEM Wire Rope meets A.P.I. specifications, and is available in all sizes, grades, and types of construction.

Purple Strand

Made of Improved Plow Steel, the strongest, toughest steel used in wire-rope manufacture. Recommended for rotary, bailing, tubing and truck-winch lines and for general hoisting work.

Form-Set

A pre-formed construction, with wires and strands pre-shaped to produce a rope which handles easier, whips less, and spools better. Will give longer life when used as a running rope.

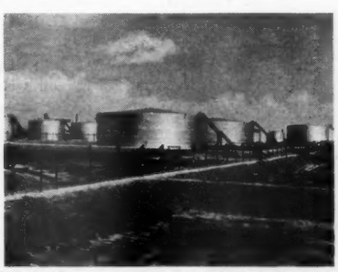
Uni-Zact

Preference has been shown for Uni-Zact core in rotary, drilling, bailing and sand lines. Uni-Zact is a parchment material which gives better support to the strands than hemp. In rotary lines the Uni-Zact core will often be satisfactory where hemp-core rope would not stand up.

Bethanizing

A remarkable improvement in zinc-coated lines that leaves the rope with all the toughness and fatigue-resisting properties of bright rope, but gives it better protection against corrosion than galvanized rope. Outstanding performances have been delivered by bethanized bailing, sand and drilling lines.

Mayari R high-strength rust-resisting steel for trucks and tanks.



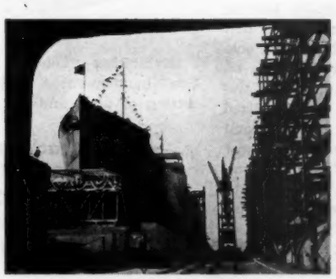
Bethlehem, as a fabricator, builds tanks of any size and type.

Bethlehem lap-weld line pipe is made to A.P.I. specifications.

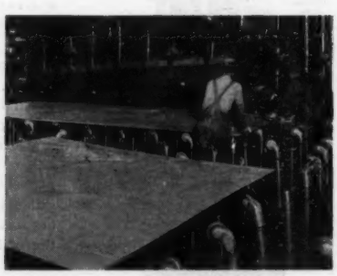
Bethlehem rolls structural steel shapes of any type and size.

Supertemp bolts and studs are ideal for high-temperature work.

Bethlehem builds all types of steel barges for the oil industry.



Bethlehem Shipbuilding Division constructs ocean-going tankers.



Bethlehem rolls plates for boiler, firebox and tank construction.

BETHLEHEM STEEL COMPANY

manufacture from the electric furnace to the finished rod. Metallurgical samples will be available for examination by interested parties. Among the many improvements are: New alloys for corrosive conditions; increased physical properties due to new and improved normalizing furnaces; a new type of ground-face coupling for sucker-rods, insuring perfect A.P.I. joints.

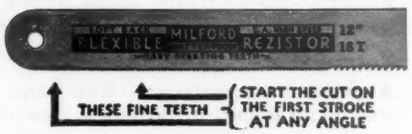
The Henry G. Thompson & Son Company
New Haven, Conn.

Booth 1225, Annex

In attendance

T. E. HEREFORD

Exhibiting the new Milford flexible Rezistor hack saw blade designed to minimize high breakage costs, and possibility of injury to workmen. These blades



are made from a special alloy high-speed steel that is extremely tough. Only the tooth edge is hardened, the back being left soft and flexible, serving as an elastic support for the hard cutting edge. All hand blades, it is stated, have easy-starting teeth on the forward end which make it possible to start a cut quickly and accurately, and at any angle. These blades are made in hand-frame sizes 8 inches to 12 inches long, all nine-sixteenths inch wide, and in a full line of power machine sizes.

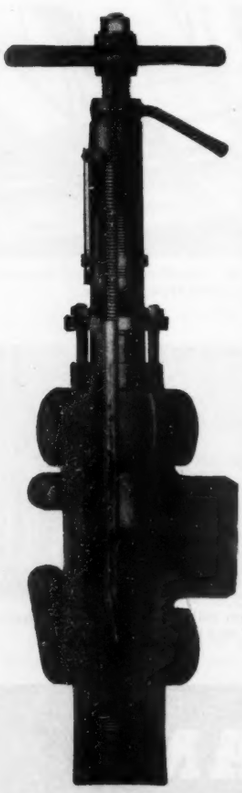
Thornhill-Craver Company, Inc.
Houston, Tex.

Booths 445, 447, Coliseum

In attendance

R. S. WARREN — T. W. WALKER
JACK HOWE — HOMER THORNHILL
KENNETH CRAVER — FORREST LEDLOW

In additions to the full line of Unibolt couplings, several new and improved products will be shown including high-pressure steel christmas tree fittings, adjustable and positive type chokes, and flexible ball joints. Each of these new products features the use of the proven Unibolt coupling principle.



The precision adjustable choke, it is stated, offers safety, ease of operation, and greater accuracy in controlling well flow. A series of shelves, cast integral with choke body, are engaged by identical shelves in the holding member. One bolt draws these self-locking tapered shelves together, applying tremendous equalized pressure on the metal seal rings. The lower end of the yoke member acts as a pilot to guide the needle point accurately to center of the orifice. Fluid flows evenly around needle, minimizing turbulence. Accurate centering of needle results in uniform wear on needle and seat. All parts are machined to micrometer precision.

The adjustable choke is quickly and easily convertible into a positive type choke, all parts being interchangeable.

Thompson Tool Co., Inc.
Iowa Park, Tex.

Booth 1016-C, outside

In attendance

L. L. THOMPSON — W. H. CLARK

Exhibiting shale separator and sample machine which is a rotary screen drum type operated by the flow of the mud separating cuttings and shale from the mud and at the same time producing an accurate sample of cuttings and mud for geological purposes.

The Timken Roller Bearing Company
Canton, Ohio

Booths 464, 466, Coliseum

In attendance

W. B. MOORE, general manager industrial division
S. M. WECKSTEIN, chief engineer industrial division
H. W. TRUMP, district manager, Dallas
S. T. SALVAGE, sales representative, Houston

Will include a comprehensive display of Timken bearings such as used in swivels, drawworks, pumps, traveling blocks, engines and similar oil field units. These bearings will be displayed in conjunction with illustrations of the various pieces of equipment.

Edgar Tobin Aerial Surveys
San Antonio, Tex., and Houston, Tex.

Booths 157, 159, 161, Coliseum

In attendance

EDGAR TOBIN — JAMES ATKINSON
EMILY ATKINSON — ROBERT KILE

Exhibit will consist of a comprehensive display illustrating the major steps in the production of its controlled aerial photographic maps, and the ownership maps and regional correlation maps developed from the aerial photographic base. Other parts of the display will illustrate the principal applications of the several types of mapping in the various phases of production operations.

Toledo Pipe Threading Machine Co.
Toledo, Ohio

Spaces 365-367, Coliseum

In attendance

C. A. WAGNER — E. H. RECKER
H. A. TIERNAN — W. R. VOSPER

Exhibiting "Toledo" power pipe machines, "Toledo" hand-operated equipment for the threading and cutting of pipe, and for bolt and rod threading.

Trackson Company
Milwaukee, Wis.

Spaces 1003, 1004, 1005, Outside, and Gulf Tractor Equipment Co. Section

In attendance

L. E. DAUER — I. W. KUNERT

Will show two machines in the "Caterpillar" exhibit. In addition to a Model PR4 Pipe Layer and Anglefiller a specially equipped High Shovel mounted on a D4 Diesel-powered "Caterpillar" track-type tractor will be shown. This machine, it is stated, has proven very successful in sevaral oil fields where it is known as a "slush pitter." It will dig slush pits, build dikes, fire walls, well sites, etc. The same unit will carry the excavated material to any nearby location, which material is frequently used as fill for building up around drill sites. The company states its High Shovel greatly speeds up the job of digging slush pits and in addition the unit also serves as a backfiller and bulldozer.

Transportation Equipment Company, Inc.
Houston, Tex.

Spaces 10-20 2B, 10-20 8A, outside

In attendance

Marmon-Herrington Co.:
A. W. HERRINGTON, president
BERT DINGLEY, vice president
C. ALFRED CAMPBELL, general sales director
HAROLD L. FISHER, sales and service engineer
CHARLES AMBROSE, sales and service engineer
RAY SCHMELTZ, sales and service engineer
R. L. SKIDMORE, sales and service engineer

Transportation Equipment Co.:
J. L. PARKER, vice president
T. E. FERRIS, office manager
W. J. VOISEN, representative
D. L. VORDERMAN, representative
W. R. HODGE, representative
J. H. ANDERSON, representative
CARL SHEEHAN, representative

Equipment displayed: Marmon-Herrington all wheel-drive trucks, Timken trailer axles and 6-wheel conversion units, Torrance steam cleaning machines, Bendix B-K power brakes, Deluxe oil filters.

Tretolite Company
Webster Groves, Mo.

Booths 638, 640

In attendance

K. R. FARR, vice president
GORDON S. NEES — M. J. MULLALLY
E. H. DAYVAULT — C. C. ROGERS
J. L. KEEL — JOE KEEVIL

Electrical display of the Tretolite method for conditioning crude oil to pipe line requirements.

Trinity Portland Cement Company
Dallas, Tex.

Spaces 1207 and 1209, Annex

In attendance

CEDRIC WILLSON, research engineer
JACK BARNES, petroleum engineer
L. L. CUMMINGS, petroleum engineer
SVEN RORDAM, director of research, central research laboratories
H. B. GILLETTE, district sales manager, Houston, Tex.

Will display photographs of unusual and outstanding oil well cementing jobs with charts showing the performance of each type of its oil well cements.

Tube-Turns, Inc.
Louisville, Ky.

Booths 618-620

In attendance

R. E. FRITSCH, vice president
J. G. SEILER, sales manager
W. B. WENTHOFF and F. S. SCHWINN, district managers for Mid-Continent and southwestern territories

Displaying its complete line of fittings for pipe welding and forged steel flanges.

H. L. Turney Co.
Houston, Tex.

Space 1065, Outside

Twin Disc Clutch Company
Racine, Wis.

Booths 1320, 1322, Annex

In attendance

G. M. GUILBERT, vice president
J. B. JENKINS, Mid-Continent manager
G. GIBSON, Dallas
C. CUSHMAN, Dallas
J. CRATER, Tulsa
E. J. CHRISTOPHER, Tulsa

Exhibiting its Model E, two-plate 18-inch clutch, cut to show its construction. This model, it is stated, is especially designed for heavy-duty services including shock loads. It will also be exhibited with a stub shaft provided with a flange for bolting to the

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GULF STATES UTILITIES COMPANY

GENERAL OFFICES: BEAUMONT, TEX. and BATON ROUGE and LAKE CHARLES, LA.

crankshaft or flywheel on an engine where an extra rigid mounting is desirable. Another product exhibited in cut-away form to show its construction, will be a power take-off unit for use with internal combustion engines. It is used on oil-field pumping engines as the standard link between engine and pump. Extra large diameter shafts and oversize antifriction bearings, it is stated, permit over-hanging pulleys slightly exceeding the width of the shaft extension to be used on these power take-offs without an outboard bearing.

A new product exhibited is Model MT multiple disc clutch. The "in-oil" type of clutch will be exhibited in single construction; the dry type in duplex construction. The duplex type may be used as a two-speed drive or one clutch may be used as a brake or a power reverse drive. Features of the new Model MT clutches are compactness, high torque capacity for size and comparatively low operating pressure required. The company will also exhibit a marine reverse and reduction gear unit.

Turco Products, Inc.
Los Angeles, Calif., and Houston, Tex.

Booth 617, Coliseum

In attendance

VACHEL O. POOLE, Houston, district manager
ANDY OSPRING, salesman

The exhibit will consist of a display and demonstrations of a variety of exclusive cleaning compounds to facilitate the cleaning operations encountered in the oil industry. These products are formulated to clean the heavy equipment found in oil fields, salvage departments, refineries, and service stations. Among the innovations to be displayed will be the new Turco car shampooing system.

Una Welding, Inc.
Cleveland, Ohio

Booths 1502, 1504, 1506, Coliseum

In attendance

W. B. BAKER, general manager
GIL V. DYE, sales representative
JAMES TATE, sales representative

Exhibit will include various types of light and heavy coated electric welding rods which are used in maintenance, repair and fabrication welding. In operation at the booth will be the Una automatic electric welding head and taper, designed for use on all production welding requiring the highest type of deposited metal. The taper, by means of a series of forming rolls and dies, completely covers wire from a coil with a woven tape previously impregnated with the fluxing elements required to produce extremely dense welds of high strength and ductility. It can be used for all types of butt, lapp and fillet joints covering tank, pipe and fabrication welding.

United States Steel Corporation
Pittsburgh, Pa.

Spaces 458, 460, 559, 561, Coliseum

In attendance

American Steel & Wire Co.

C. F. WILEY — H. R. KLEIN
T. A. GOGGINS — E. T. EGGERS
H. L. RICHARDSON — SEARS DOAN
OTTO KROEGER — R. M. PETERSON
J. V. McGINTY — P. T. COONS
H. RIDDLE — D. CARLTON

Carnegie Illinois Steel Corp.

E. C. NOBLE, JR. — J. J. NEWPORT
K. E. LUGER — F. L. GIBBONS
H. S. SCHROEDER — A. L. KAY

Cyclone Fence Co.

A. M. EATON — W. B. MOORE
JOE DENTON — J. D. HILL
L. E. KING

Tennessee Coal, Iron & Railroad Co.

E. E. ALDOUS — G. J. STEWART
F. C. BUCK — W. H. ANDREWS
E. G. LAWS — J. F. TOMPKINS
R. J. STAKELUM

Universal Atlas Cement Co.

C. H. BOICE — I. F. BINGHAM
R. L. CHANCE — N. C. HOYT
G. G. SMITH

The United States Steel Corp. subsidiaries are arranging an unusually complete and interesting display of products used in the petroleum industry. Featured in this exhibit will be Unaflo and Lumnite as well as other cements, Tiger brand wire rope, Excellay preformed wire lines, and American electrical wires and cables, Cyclone property protection fence and gates, roofing and siding sheets, high tensile and alloy steels, and special examples of the increasing use of stainless steel for high strength and corrosion resistance.

U. S. Bureau of Mines

Spaces 1609, 1611, 1613, 1615, Annex

Union Carbide Co.
New York, N. Y.

Spaces 109, 111, 113, 115, Coliseum

Universal Engineering Co., Ltd.
Los Angeles, Calif.

Spaces 305, 317, Coliseum

University of Texas
Austin, Tex.

Spaces 1730-1732, Coliseum

United Supply & Manufacturing Company
Tulsa, Okla.

Booths 1203, 1205, Annex

In attendance

H. B. GUTELIUS, president
F. P. THEIMAN, vice president
C. J. HALLORAN, vice president
C. M. HOLLAND, Houston manager
W. T. DAVIS, Houston salesman
C. S. HERNDON, Houston salesman

Display will consist of A. Leschen & Sons wire rope, line scales, Lovejoy flexible couplings, and a general line of oil field supplies.

Utility Electric Steel Foundry
Los Angeles, Calif.

Booth 1400

In attendance

J. T. KIDD, sales engineer
RALPH FANNIN, district representative
FRANK K. BENNETT, sales representative

Displaying hot oil pump stainless steel parts and chrome molybdenum vanadium stainless plungers; bubble caps, vapor pipes and return bend plugs; carburizing and cyanide pots and boxes; 18-8 stainless steel interior parts for pump, gas regulators and orifice fittings; 18-8 stainless parts for salt and mine water service; heat resisting miscellaneous parts.

U. S. Employment Service
Houston, Tex.

Spaces 1725, 1727, 1729, Coliseum

Vapor Recovery Systems Company
Compton, Calif.

Booths 147-149, Coliseum

In attendance

FRANK V. LONG — H. O. JOHANSON
T. E. WARD — FRANK M. HOLLOWAY

Exhibit will include tank vents, including conservation vent valves, flame arresters; swing line equipment, including tank winches, cable brackets, swing joints, swing line nozzles, and cable collar clamps; gauge and thief hole covers; manhole covers; gas-tight automatic tank gauges; marine valves; roof nozzles for oil tanks.

Victor Mfg. & Gasket Co.
Chicago, Ill.

Booth 1573, rear of Annex

In attendance

A. J. AUKERS, engineer
E. T. FREEMAN, sales representative

Displaying replacement gaskets for operating equipment such as engines, transmissions, speed reducers and all related drive mechanisms, as well as pumps. The gaskets will be of metal-asbestos composition (cylinder head, manifold, and washer flange gaskets such as used in original equipment by the manufacturers), and various treated paper, fiber and compressed asbestos sheet packings. Also all types of gaskets and packings used in the pipe lines and the equipment needed for regular replacement in the oil field industry.

A complete display of the latest development in the oil seal industry—Victoprene oil seals, cups and packings, made in a synthetic rubber compound.

Victualic Company of America
New York, N. Y.

Booths: Hanlon-Waters and Norvell-Wilder sections

In attendance

M. C. HUTCHINSON, vice president and general manager
A. G. BALDWIN, vice president in charge of sales

Display will consist of full line of pipe couplings manufactured for pipe diameters from three-quarters inch through 60 inches. Both malleable iron and forged steel couplings, as well as line of malleable full-flow fittings will be exhibited. In addition, the company announces various working and pressure models will be on display, demonstrating the absolute leaktightness, flexibility and ability of couplings to take care of expansion and contraction.

Viking Pump Company
Cedar Falls, Iowa

Booth 1046, outside

Viking rotary pumps will be featured in the Southern Engine & Pump Co. Booth 1046 (outside). A unit of particular interest is the Viking idler drive pump direct connected to Le Roi engine These pumps are used in the oil fields for pickup service. The units are mounted on structural steel bases for easy portability.

Visco Products Company, Inc.
Houston, Tex.

Booth 202, Coliseum

In attendance

L. V. MUSGROVE — D. M. JACKS
F. L. STONE — F. A. KROLL
F. H. THORNE — C. F. SPANGLER

Visco oil treating chemicals featured in the exhibit were introduced after several years of research and actual field experiments directed to the development of an entirely new type of treating chemical for the breaking and resolution of oil field emulsions. These treating chemicals were a departure from the soaps, water-softeners, and sulfuric acid treated fatty oils then in general use for this purpose. Instead of being compounded by mixing various substances in an effort to produce effective reagents, it is stated the active principle in each Visco formula is a complex synthetic chemical especially made in a modern plant under a system of rigid chemical control.

Volcano Burner Company
Houston, Tex.

Booth 1544, Annex

In attendance

ROY S. DODD — J. H. MITCHELL

Will show two models of all-steel, low-pressure gas burners manufactured by the company—the Gulf State and the Volcano Superior. The Volcano Superior will be featured in a new model designed for the largest, new type boilers used for rotary drilling. This model incorporates several important new features in gas burner construction.

Henry Vogt Machine Co.
Louisville, Ky.

Booths 715-717, Coliseum

In attendance

G. A. DAEUBLE, JR., manager of valves and fittings sales
W. S. CANNON, JR., assistant manager of valves and fittings sales
HENRY VOGT HEUSER, engineer
J. L. MASSIE, manager of Dallas office

Will display a complete line of drop forged steel valves, fittings and flanges. Valves will be shown in globe and gate types with screwed and flanged ends for pressures ranging from 150 pounds to 1,500 pounds,

FOR PIPE'S SAKE – *Use Kinzbach-Ajax Slips*
Whether it's Drill Stem or Tubing

10 Advantages You Get in the Kinzbach-Ajax Rotary Slips:

1. Broad faced inserts eliminate scarring of drill pipe and casing.
2. Alloy steel body gives you greater strength to meet today's deep well requirements.
3. Inserts, held in place by two alloy steel pins in each segment, prevent loss through shearing action or breakage.
4. Three segments to the half provide greater flexibility and closer pipe fit.
5. Broad area of backs protects rotary master bushing against cutting.
6. Even distribution of load over entire gripping surface is assured because each insert is individually anchored to slip segment.
7. Easily dismantled and serviced on derrick floor, eliminating machine shop overhaul.
8. Due to design of segments, drilling mud drains back into hole, instead of on derrick floor.
9. Light weight keeps excess lifting burden off of roughnecks.
10. Costs reduced since, by changing inserts, several pipe sizes can be handled with one set of segments.

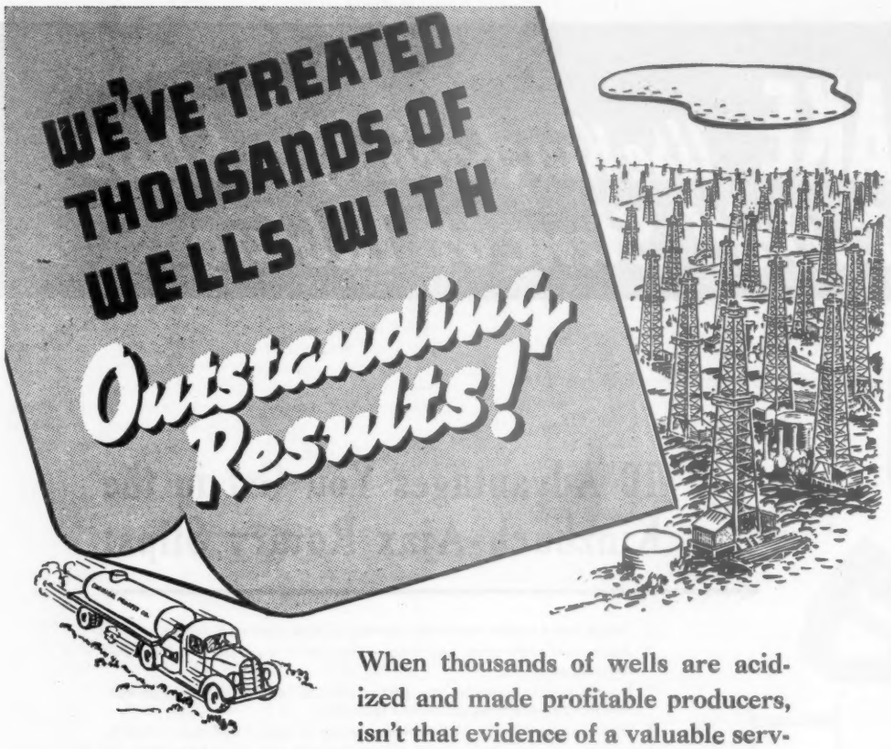
SEE THESE AND OTHER KINZBACH PRODUCTS ON DISPLAY AT OIL-WORLD EXPOSITION

Kinzbach-Ajax Tubing Slip and Bowl Offer 10 Distinct Advantages

1. Bowl is gated in the side to permit placing around pipe without breaking connections, with gate block fitted into grooved slot and locked with bolt, insuring correct position with no abnormal strain on any one part of the assembly.
2. Upper flange on bowl wide enough to serve as shelf for slips when not engaging pipe.
3. Lower flange squared to fit into square of rotary table when running tubing through rotary.
4. Four-piece unit type construction provides maximum flexibility.
5. 2" and 2½" tubing handled with same segments by changing size of inserts . . . easily done on derrick floor.
6. Length and position of handles keep operators' hands clear of elevators.
7. Length, position, positive grip and safety latch of handles provide maximum safety to workmen.
8. Segments cored to permit drain of fluid back into hole, assuring cleaner, safer working conditions.
9. Positive hinges prevent slips opening to the point where handling is difficult.
10. Like other Kinzbach-Ajax Slips, they cannot cut, mar or bottle-neck the pipe, and will give long, dependable service.

KINZBACH TOOL CO., INC., HOUSTON, TEXAS

KINZBACH



When thousands of wells are acidized and made profitable producers, isn't that evidence of a valuable service? New wells with small production—old wells which were thought "dead"—have been made into big producers by the Chemical Process method of acidizing—what we have done for thousands of others, we can do for you, too. Just give us a call, at any time, and we'll get right on the job!

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OF OIL AND GAS WELLS

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RUSSELL, KANSAS
Tel 493—C R Vincent

WICHITA, KANSAS
Tel 2-2478—C V Burkett

SHREVEPORT, LA.
Tel 2-3665—F F Carr

HOBBS, N. M.
Tel 444—P W Morrison

SEMINOLE, OKLA.
Tel 844—T S Lancaster

TULSA, OKLA.
Tel 3-0807—M E Chapman

BRECKENRIDGE, TEXAS
Tel. 206 and 306—C K. West, P W Pitzer, G R. Whitney, A J Buchanan
Tel. 649—A C Hanna
Tel 745—B. M Kingston

ANSON, TEXAS
Tel 41—J. T. Vernon

LULING, TEXAS
Tel 390—O K. Wills

ODESSA, TEXAS
Tel. 21—C F Hogan

WICHITA FALLS, TEXAS
Tel 2-4307—W E (Bill) Norton

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SEEP CUPS

Made exclusively by
C. L. & W. W. AUER
Established 1880 Corry, Pa.

STAR CUPS

in sizes from one-quarter inch to 6-inch. Fittings such as ells, tees, crosses, etc., will be shown with screwed

and welding ends. A 6-inch 1,500-pound valve with bypass, believed to be the largest drop forged steel valve ever built, will also be on exhibition.

New valve items to be shown for the first time are: 150-pound drop forged steel American standard, integral flanged, gate valves; 300-pound drop forged steel American standard, integral flanged, gate valves; drop forged steel gate meter valves, union bonnet type, in quarter-inch, three-eighths inch and half-inch sizes.

W. L. Walker Company
Tulsa, Okla.

Booth 1574, Annex

In attendance

W. L. WALKER W. L. WALKER, JR.

W. L. Walker Co. will display the new and improved Tulsa oil thief with various sizes and standards used in different fields; Tulsa safety gauging reel;

six-volt centrifuging machine to be attached to car batteries; car type oil sample water heater; Tulsa safety hydrometer case; gauger's equipment case.

Walter Kidde & Co., Inc., will display various types and sizes of hand portable Lux carbon dioxide fire extinguishers.

Wall Rope Works, Inc.
New York, N. Y.

Booth 648, Coliseum

In attendance

HOWARD S. LIPSON, advertising manager, New York

JIM ENGLAND, Gulf Coast salesman, Houston

J. L. DITTMAN, Tulsa

The company's line of manila catlines will be exhibited for the first time at the Houston exposition under the new "Black-Gold" trade name, marked with a black, gold, and black yarn cover marker running throughout the length of the rope and providing distinctive identification. The marker replaces the two purple marker yarns formerly used. These improved catlines are the result of considerable efforts to develop a balanced construction and lubrication that will resist successfully the wear, tear, and hard usage catlines are subjected to around a rig. Tests over a period of time, coupled with successive adjustments,

show remarkable improvement without any loss of flexibility or ease in handling. Made up in 1¼-inch and 1½-inch diameter they are described as a special grade of rope for cat-heading purposes where lasting tensile strength and durability are required for heavy work.

Walworth Company, Inc.
New York, N. Y.

Booths 656, 658, 660, 757, 759, 761, Coliseum

In attendance

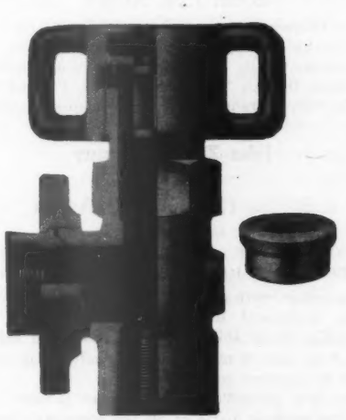
W. B. HOLTON, JR., president
HOWARD COONLEY, chairman
J. M. OLMSTED, vice president of sales
F. W. DUEMLER, vice president of sales
F. H. MOREHEAD, vice president of engineering
J. D. McMANUS, assistant chief engineer
C. L. BRADBURY, manager, Dallas
W. M. COMBS, manager, Tulsa
C. G. FINKLE, manager, Houston
E. L. CLARK, field sales
H. C. NANNEN, in charge refinery sales
H. G. LAMBERT, assistant manager, tool division
P. B. MILLER, tool sales
A. J. POKORNY, field sales
J. L. RICE, field sales
D. L. RUMSEY, field sales
J. G. YOUNGGREN, field sales
F. S. MARKLE, field sales
R. J. GLASSCOCK, field sales
L. F. LAMBERTY, field sales

Representative valves, fittings, pipe, and tools will be displayed upon an especially constructed background. Mud line valves, the company's Figure 85 flow line drilling gate valves, and its line of lubricated plug valves will have prominent display. Featured will be a 10-inch motor-operated carbon molybdenum steel gate valve designed for service at 1,500 W.S.P. at 950° F. This valve, which weighs more than 3,000 pounds, will be electrically equipped to demonstrate operation. Another valve featured will be a 14-inch cast steel valve for 3,000 pounds W.S.P. at 950° F., equipped for high-speed motor operation. The company's C.N.I. flanged pipe, pipe wrenches, and genuine Stillson wrenches will also be exhibited.

Well Equipment Mfg. Corp.
Houston, Tex.

Spaces 1224, 1226, 1228, Annex

Exhibiting the "Weco" Dizzy Thread 6,000-pound union, described as the original wing union, which it is stated, provides a practical, easy means of assembling and dismantling pipe joints without the use of wrenches. It has a replaceable bronze bushing. The special Dizzy Thread enables the operator to make-up and break-out the union by 1¼ turns of the nut and a light lick with a hammer. It is a time and money saver on mud, water, oil, steam, or any other lines where high pressures are prevalent. Also exhibited will be the company's wing union for 600-pound steam working pressure, made in sizes from 1 to 8 inches,



inclusive, its Speed Thread union with blanking plug tapped to take pressure gauge, especially adaptable for use on christmas tree assemblies; 3,000-pound speed thread union incorporating all of the regular advantages of its other wing union types.

Westcott and Greis, Inc.
(Division of American Meter Company, Inc.)
Tulsa, Okla.

Spaces 726, 727, 728, Coliseum

In attendance

J. H. SATTERWHITE, manager, Tulsa
H. W. WAHL, Dallas office
C. C. CLOVER, Tulsa office
R. A. MARSH, Houston office
B. E. KEELING, Amarillo, Tex.
VAL LINK, JR., Shreveport, La.
C. J. ELMER, Houston
A. F. BENSON, engineer of American Meter Co., Erie, Pa.

Showing positive displacement meters, flow meters, flow and proportional control and remote recording and control; products of American Meter Co., Erie, Pa.

Back-pressure regulators, vacuum regulators, liquid control; products of Davis Regulator Co., Chicago.

Orifice change fittings; products of Robinson Orifice Fitting Co., Los Angeles.

House service regulators and gas reducing regulators, made by both the Reliance Regulator Corp. of Alhambra, Calif., and Chaplin-Fulton Manufacturing Co. of Pittsburgh, Pa.

Automatic vacuum breaker valve for oil pipe line work; product of Westcott & Greis, Inc., Tulsa.

Water meters, oil and gasoline meters; product of Buffalo Meter Co., Buffalo, N. Y.

Westinghouse Electric & Manufacturing Company
St. Louis, Mo.

Booths 1227, 1229, Annex

In attendance

Q. M. CRATER, manager, petroleum section, East Pittsburgh, Pa.
M. A. HYDE, petroleum engineer, petroleum section, East Pittsburgh, Pa.
W. C. DREYER, petroleum engineer, Dallas, Tex.
R. A. SWINDELL, petroleum representative, Dallas
W. C. CARTER, petroleum representative, Houston

Will exhibit a weather-proof motor running under a spray of water, a cutaway general purpose motor, a demonstration of capacitors for power factor correction, a stroboscopic demonstration device, an operating model of a completely protecting transformer, equipment for cathodic protection of pipe lines against electrolysis and a gear unit for oil-well pumping.

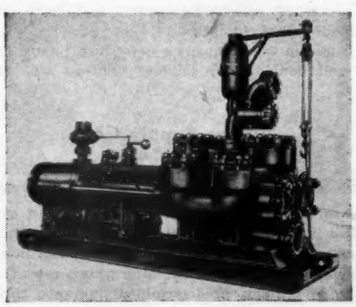
The Wheland Company
Chattanooga, Tenn.

Spaces 150, 152, 154, 156, 158, 160, 251, 253, 255, 257, 259, 261, Coliseum

In attendance

E. F. WHELAND — C. W. WHELAND
G. E. WHELAND — A. C. WILLINGHAM
GEORGE E. CAMPBELL, chief engineer

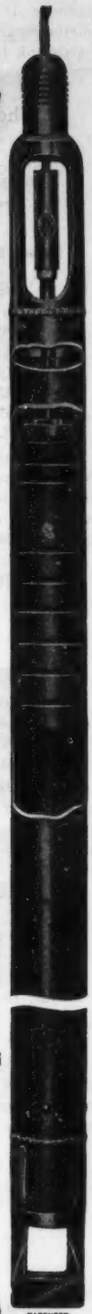
Product exhibited: H-20000-AA steam slush pump. Designed for higher pressure, smoother operation,



H-20000-AA steam slush pump

more mud at reduced steam consumption. Size 15½-inch by 8-inch by 20-inch, maximum steam capacity. Recommended for maximum 350-pound steam pressure. Revolutionary upside-down self-draining steam-end construction. Construction provides improved cushion, improved thermal efficiency, increased mean effective steam pressure and elimination of broken rings and cylinder heads. Exhaust steam must blow out condensate before leaving cylinder. All liner adjustment screws are on the outside of the cylinder. No screws or threads are in the mud stream. The

IN WORLD WIDE USE MILLER



MORE MILLER'S ARE USED IN CLEANING-OUT THAN ALL OTHER SAND PUMPS MADE

The Reason IS BUILT INTO The MILLER

● The RESULT is oil in your tanks in place of sand in your well. Get FULL production from your wells. CLEAN-OUT with a MILLER.

The MILLER is made in diameters of 2½, 3, 3½, 4, 4½, 5, 5½, 7 and 9 inches and lengths of 20, 25 and 30 feet. 5/32-inch wall thickness in REGULAR Type. ¼-inch wall tubes in HEAVY Type Sand Pumps.

INTERCHANGEABLE BOTTOMS
To Meet Every Condition

● BAILER BOTTOM
With the Bailer Bottom installed the MILLER is quickly changed to a Bailer giving you a combination of either Bailer or a Sand Pump in one tool.

● SAND BOTTOM
Used when tools are run and when well is shot to quickly remove loose material.

● STAR BOTTOM
Used for cutting the sand loose.

● CHISEL BOTTOM (In Pump)
With this bottom tightly packed sand can be easily broken in small pieces so it can be picked up in the pump.

Write for Descriptive Folder and Price List

See Pages 1564-65 COMPOSITE CATALOG

MILLER Sand Pump Co. ALSO DRILLING EQUIPMENT DIRECTORY

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Describing Orifice fittings, plates, meter runs, check valves, high pressure manometers, vapor pressure bombs, etc. It is yours for the asking.

DANIEL ORIFICE FITTING COMPANY
LOS ANGELES, CALIFORNIA

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TULSA—Jos. A. Coy Co., 2408 East 4th Place.
DENVER—Joy & Cox Inc., 1940 Blake St.
NEW YORK—J. A. Moore, 342 Madison Ave.
LOS ANGELES and SAN FRANCISCO—Paramount Manufacturing Co.
LONDON—Process Equipment Co.

cylinder is packed by independent gland. Rocker shafts mounted on ball bearings. Rocker shafts and valve link fully enclosed and operate in oil. Improved construction of cylinder head and liner retainer.

Wharton Chamber of Commerce
Wharton, Tex.

Spaces 1724, 1726, Ground Floor

The White Motor Company
Cleveland, Ohio
(Texas Branches—Houston, Dallas, Fort Worth)

Spaces 1066A, 1067B, outside

In attendance

ROBERT F. BLACK, president
J. N. BAUMAN, vice president
C. B. COWAN, vice president
L. B. HUGHES, district manager
A. C. NEWLON, branch manager
G. B. BLAKELEY, export department

Exhibiting Model 942-S White truck, tandem drive, fully equipped for oil field work. A Model 750 White truck, single axle drive, fully equipped for oil field work, and cutaway motor of the new White super-power engine used in the White Model 750 truck.

Whitney Chain & Mfg. Company
Hartford, Conn.

Booths 258-260

In attendance

W. H. WHITNEY, president
R. J. HOWISON, general sales manager
J. W. ANDERSON, Mid-Continent representative
W. E. SCHAEFER, chief engineer
R. L. MULLANEY, engineer

Exhibit will be Whitney roller and silent chain in pitches and widths up to 2½ inches, also sprockets, flexible couplings, with illustrations of their applications.

Wickwire Spencer Steel Company
New York, N. Y.

Booths 359-61, Coliseum

In attendance

R. L. FOSTER — R. J. JONES
D. J. HENECKER — O. C. ELLIOTT
K. A. ZOLLNER — E. J. DALY

Paneled display with illusion box, stressing increased service life with resulting lower costs through the use of the company's drilling lines and other ropes used in the oil industry.

Wico Electric Co.
Springfield, Mass.

Booth 657, Coliseum

In attendance

VICTOR K. HUNT, sales manager, trade sales division
LEON F. SMITH, southwest district manager
HARRY LOLLY, Tulsa branch, sales department

Background of exhibit will be of modernistic design and on display will be models of magnetos, some of which have been in the oil fields for years, but still being used in large quantities. The feature attraction will be the new models, particularly the new Model C, in the construction of which the company employs to a considerable degree, modern plastics. This has enabled it to build a magneto of excellent quality at the lowest list price without sacrificing anything in spark output or sturdiness. One of these new magnetos, constructed with transparent plastic, will allow the public to view the magneto in operation. The company will show models suitable for tractors, heavy-duty engines, small engines of one, two and four cylinders and even flywheel magnetos for fractional horsepower engines or outboard motors.

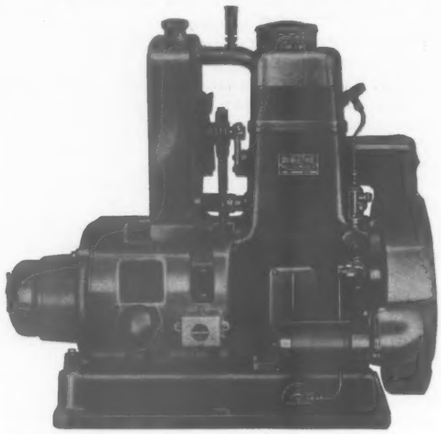
Witte Engine Works
Kansas City, Mo.

Space 1024-A, outside

In attendance

P. E. PARKER, chief engineer
C. B. BERRY, sales department
DEWEY PHILLIPS, factory representative

The exhibit consists of one 3 KVA Witte vertical Dieselectric plant for automatic operation; one 7½ KVA vertical Dieselectric plant electrically started; one 9-hp. vertical Diesel engine with gas conversion equipment to operate on natural gas. (This manually start-



ed unit is equipped with twin-disc clutch for power drive.) One 5 KVA Witte horizontal Dieselectric plant manually started; one 8-hp. special gas-gasoline engine used for small pumping jobs (also manually started). All Witte vertical units may be equipped for electric starting.

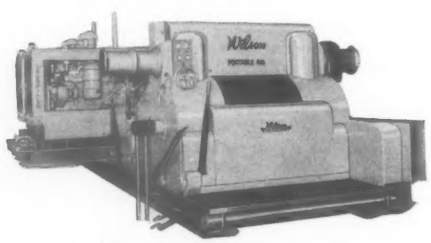
Wilson Manufacturing Co., Inc.
Wichita Falls, Tex.

Booth 1045, outside

In attendance

JOHN H. WILSON — BERT LIGON
VAN LIGON

The feature will be the company's new streamlined rotary drilling rigs. These new rigs are fully enclosed in a streamlined case and are unmatched for



beauty and utility, President John H. Wilson adds, and are equipped with improvements in which operators are sure to be interested. The new Wilson Giant Model rig pictured above is equipped with air-controlled drum clutches, or hand lever controlled, as preferred; new water-cooled friction clutches, available on both low-speed and high-speed drum drive; water-cooled brakes, fully enclosed, circulating type; new protected instrument panel, and new rubber cushioned engine clutches.

In addition the company's new slush pump, single-drum and double-drum spudder winches will be on display.

Wilson Supply Co.
Houston, Tex.

Booths 234, 236, 238, 240, 339, 341, Coliseum

The advanced Nixon surface control gas-lift system exhibited is completely controlled from the surface by an intermitter which is in a weather-proof housing. The time control clock in the intermitter, releases gas pressure at regular, predetermined intervals, through the surface operating valves into a weight cylinder suspended over the well. This cylinder, by means of a wire line, raises a weight bar into the flow valve in the well, permitting gas pressure from the annular space to enter tubing and lift a column of fluid to the surface. When the fluid reaches the surface, it releases pressure in the weight cylinder, allowing the weight bar to lower out of the flow valve, which is then closed by pressure in the annular space.

The control gas-lift system, it is stated, handles large or small volumes of fluid from either high or low fluid levels. Economy, dependability and efficiency feature its operation.

W-K-M Company, Inc.
Houston, Tex.

Booths 605-611 inclusive, and Booths 504-510 inclusive, Coliseum

In attendance

L. O. KOEN, vice president
T. M. SMITH — H. B. COOKSTON
D. M. "RED" GRIFFITH — F. M. BLACK
A. B. CALKINS — G. M. FINFROCK
AL PELTZER, Merco Centrifugal Co., San Francisco, Calif.
E. N. CORNING, Everlasting Valve Co., Jersey City, N. J.

Complete display of W-K-M through-conduit lubricated gate valves. These valves will be displayed in cutaway models, operating models and assembled in christmas trees. W-K-M tubing slips and spiders in the regular type for wells to 3,000-foot depth, deep-well type for wells to 7,000-foot depth and the new Series 12,000 models for wells to 12,000- and 14,000-foot depths. Hauser roller kelly drive, for drilling in under pressure or with oil, using a joint of tubing or drill pipe as a kelly. W-K-M sucker-rod hanger, a portable device suspending the sucker-rod in the derrick on flexible chains which avoids the usual damage and kinking caused by laying the rods down on a walk. W-K-M mud screen, a self-contained unit driven entirely by the flow of mud returns, which operates a pelton wheel which drives a large screening drum.

The display also shows W-K-M rotary slips, W-K-M King-Pin brake lining and brand band exchange. Especially compounded inserts are spaced at regular intervals throughout the lining. A complete line of W-K-M pipe line equipment will include the new J-M coating and wrapping machine. W-K-M paraffin cutter.

Everlasting Valve Co. will display with W-K-M its complete line of blowoff valves and boiler feed valves.

The W-K-M Co. will display the L-K cementing plug for which it is exclusive export distributor.

Merco Centrifugal Co. of San Francisco will display the Merco centrifuge, a device for removing sand from drilling mud. This machine is also used for recovering mud weight material.

Yellow Transit Co.
Oklahoma City, Okla.

Booth 1012-B, east of main entrance (outside)

In attendance

A. J. HARRELL, president
EVANS A. NASH, vice president
M. M. HARRELL, general manager
E. D. HICKS, JR., superintendent of operations, Oklahoma City
R. H. BILLS, commercial representative of Houston
T. A. NEWBY, commercial representative, Houston

Exhibit will be of the latest type, cab-over-engine truck-trailer with closed van type semitrailer. (Mack truck, Fruehauf trailer.) Trailer will be equipped with furniture, telephone, lights, etc., for use of visitors.

J. E. Young
Houston, Tex.

Booth 1536, Annex

The following companies' products will be on exhibit in this booth: Calmec Manufacturing Co., Ltd, Los Angeles, Calif., pump valves; Kaye & MacDonald, Inc., West Orange, N. J., steam traps; Packing Engineering Corp., Cranford, N. J., mechanical packing.

John Zink Company
Tulsa, Okla.

Booths 1513, 1515-A, Annex

In attendance

JOHN S. ZINK — JAMES ARTHUR MOORE
ROBERT D. REED — JAMES A. MORGAN

Displaying vertical Bi-Mix gas burners for drilling boilers, horizontal Bi-Mix burners for stills, semi-mechanical steam atomizing oil burners and the new John Zink Multi-Way Frame combination gas and oil burner for general refinery use.

The new Multi-Way Frame burner is built to receive the working parts of all the company's burners used throughout the refining industry. This added feature is available on Series Y, Series HBM, Series BMD, and Series BMY burners. Sizes range from 14 to 30 inches with capacities from 2,000,000 B.t.u./hr. to 40,000,000 B.t.u./hr.

ENGINEERING and OPERATING

In This Issue

APRIL 20, 1939

LUBRICATING OIL AND BEARINGS OF VARIOUS CONSTRUCTION

By R. J. S. Pigott and Paul G. Exline ..... *Page 258*

This paper, delivered before the A.P.I. eastern district, Production Division, at Pittsburgh, is the outgrowth of the authors' study of the mathematical theory of liquid lubrication, a subject which requires time, inclination and training not usually at the disposal of the average engineer. In plain language the writers present their conception of the sleeve bearing operation with a view to showing that, in spite of the extraordinarily simple mechanical construction of a bearing, its behavior actually is extremely complex; and it is this assumption, that the structural simplicity applies also to the behavior of the bearing, that has led to endless grief in design and operation.

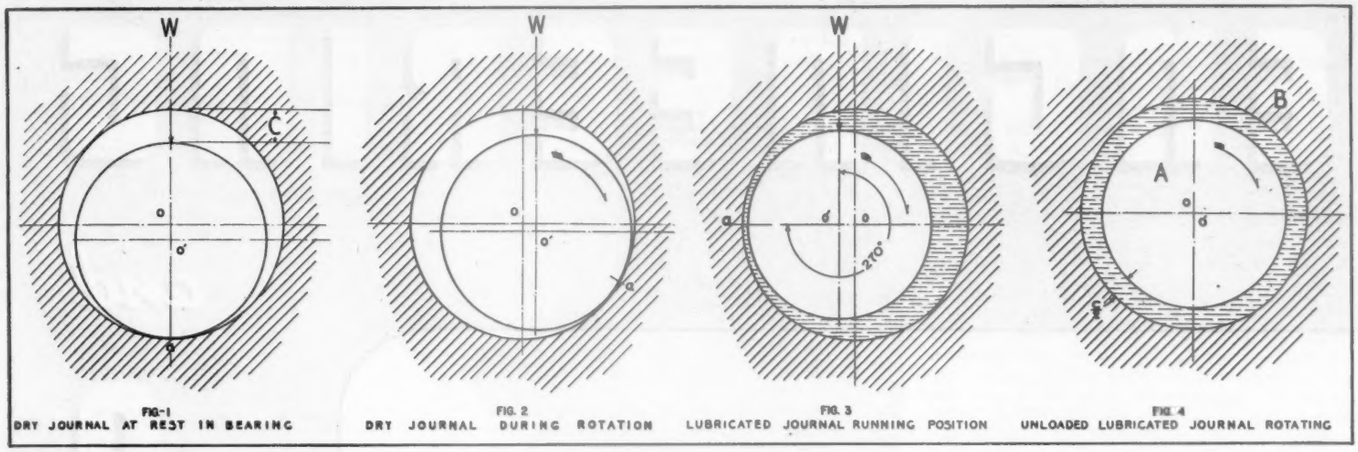
POWER CONSUMED BY REDA PUMPS IN OKLAHOMA CITY FIELD

By W. H. Stueve ..... *Page 264*

Since its discovery the Oklahoma City field has produced 443,088,298 bbls. of oil up to the first of the current year and approximately 71.5 per cent of this production was from the Wilcox zone. Production has been increasing from the Wilcox zone and at the present time 82.2 per cent of the oil is obtained from that horizon; during 1939 this source will supply approximately 85 per cent of the field's total production. Several changes in the manner of getting the oil to the surface have taken place in the capitol city area and about five years ago Reda pumps were first introduced. Their use has become more widespread until now there are 139 pumps of this type installed on Wilcox sand wells producing almost one-half of the field's total output. The paper is a discussion of the electrical current used during the five years since the first installation in March, 1934, to February, 1939.

OPERATING IDEAS ..... *Page 263*

QUESTIONS ON TECHNOLOGY—*By C. K. Francis, Ph.D.* ..... *Page 269*



Oil and the Bearing

By R. J. S. PIGOTT and PAUL G. EXLINE
Gulf Research & Development Co.

The average engineer has not, usually, the time to study the mathematical theory of liquid lubrication, and even if he does become familiar with it, it is not yet of very much use to him since he cannot design a successful bearing from the present mathematical development alone. For one engineer who can play with the mathematics, there are a thousand who have neither the time, inclination, nor training, to enter fully into this highly specialized line and unfortunately there appears to be nothing in the literature that will tell the ordinary engineer in plain language what happens in a bearing, and why, without struggling through differential formulae.

About a year ago, our first attempt at such a brief description of bearing theory was made and delivered in two lectures by one of the authors, before the Engineers Society of Western Pennsylvania and the Tulsa local section of the American Society of Mechanical Engineers. The reception of this paper was sufficient to indicate that there was a need for simple presentations of the subject.

We wish to place before you the concept of the sleeve bearing operation, with a view to showing that, in spite of the extraordinarily simple mechanical construction of a bearing, its behavior actually is extremely complex and it is the assumption that the structural simplicity applies also to the behavior of the bearing that has led us into endless griefs in design and operation.

So far as running conditions are concerned, most bearings could be run on any liquid that had sufficient viscosity for the purpose; in fact, bearings have actually been lubricated with air, water, and syrups. The reason oil is used universally, however, for the lubrication of bearings is that it is the only material which has a high resistance to change of character under the operating conditions, is non-corrosive in general, but cheap enough to use.

A full bearing, one which completely surrounds the journal, must necessarily be larger in diameter than the journal which runs in it. With the journal at rest it will take the position shown in Figure 1, whether a lubricant is present or not. A vertical line drawn through the centers of both journal and bearing will intersect their common point of contact. Clockwise rotation of the dry journal will cause a counter-clockwise rotation of the line of centers as the journal rolls up the side of the bearing until slippage occurs (Figure 2). If the clearance space is filled with a viscous liquid, a surprising difference of behavior occurs. Instead of moving to the right, the line of centers now moves in the direction of the journal which is picked up by the oil film until an appreciably thick film exists between the two even at the point of nearest approach, as shown in Figure 3.

The condition of operation in which a film of lubricant completely surrounds the journal is referred to as "thick film" lubrication and is the basis of nearly all mathematical analyses of lubrication. "Boundary" lubrication describes the condition existing when the oil film cannot maintain complete separation but permits intermittent and partial metallic contact to take place. "Plastic" lubrication takes place when a grease or semisolid replaces the liquid and is usually under "boundary" conditions.

Thick Film Lubrication

The reason a liquid film can "float" a loaded journal was first clearly shown by Prof. Osborne Reynolds in 1886 and was based on Beauchamp Towers' experimental data of 1883 and 1884. Petroff in 1883 had recognized the connection between viscosity and friction, but Reynolds gave us the entire basis of the modern theory of liquid lubrication through application of the same principles of fluid dynamics with which he analyzed the behavior of fluids in pipes and channels.

An unloaded lubricated journal in a bearing of infinite width is represented by Figure 4. The journal is completely surrounded by a uniformly thick film of oil. There is obviously no pressure developed in the oil film and no force other than gravity causing it to flow out of the clearance space; it is simply dragged around by the shaft. Now, if a load is placed on the shaft, it is clear that pressure must be developed in the lower half of the film, or the shaft must sink through the film and rest on the sleeve in metallic contact, which we know does not happen. Reynolds demonstrated mathematically that the only way a load-supporting pressure can be built up in the film is for it to assume a converging wedge shape in the direction of rotation. The only necessary assumptions to this development were that the liquid had a finite viscosity and that the velocity of the liquid at each boundary surface was that of the surface. Referring again to Figure 3 it is seen that this wedge starts at *A*, the point of maximum clearance. The quantity of oil entering the wedge per unit width of bearing will be given by the product of the film thickness and the average velocity of the oil. Since the velocity of the oil at the bearing surface is zero and is equal to the journal speed at its surface, its average velocity is half the peripheral speed of the journal. If no pressure were built up in the film, the average oil velocity would remain the same at all points around the journal since the boundary velocities remain the same. This would be an impossible condition because the converging wedge would then require that a smaller quantity of oil be passing each point in the film when going from *A* to *B*. Since the progressive disappearance of a quantity of oil over this path is impossible, it is quite evident that a pressure distribution must be built up which must cause the mean oil velocity to increase as the clearance is reduced. This pressure distribution then takes the shape shown in Figure 5 plotted on the developed surface of the bearing. It is important to notice that while the pressure distribution is symmetrical about the line of centers, the

A.P.I.

R. J. S. Pigott

Paul G. Exline

Paper presented before annual meeting of the Eastern District, Production Division, Pittsburgh, April 4, 1939.

pressure over the upper part of the bearing is negative.

An increase in the load or a decrease in the viscosity or speed will cause the journal to move to the left and if carried to an extreme, the eccentricity becomes so great that the shaft touches the bearing. At this point the film begins to break down, metallic contact occurs, and the conditions become those of boundary lubrication. Except for a few cases where the materials are selected for the purpose, and the rubbing speeds are very low, abrasion and seizure will result.

Plane Surfaces

The development of a Reynolds' wedge has also been shown necessary for the maintenance of film lubrication in plane sliding surfaces. The mathematical analysis of plane surfaces is much simpler than for cylindrical bearings and consequently a high degree of success has accompanied the computation of the behavior of sliding plates used in thrust bearings of the Kingsbury or Michell type. In Figure 6, *D* shows such a shoe, one of a number spaced around the periphery of the disc *A*, revolving around axis *C* under load *W*. As rotation occurs, shoe *D* tips up to form the Reynolds wedge between *D* and the stationary disc *B*. The

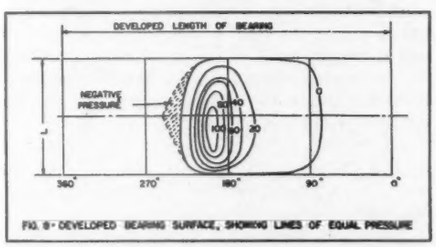


FIG. 8 - DEVELOPED BEARING SURFACE, SHOWING LINES OF EQUAL PRESSURE

distribution of pressure along the center line of the shoe is shown immediately below the shoe. The pressure distribution over the plane surface of the shoe is shown in Figure 7 in which the isobaric lines are drawn for each tenth of the maximum pressure at *P*. The resultant of the pressure forces acts through the point *W* which is directly under the pivot.

Finite Bearings

Actual bearings deviate from the simple assumptions in theory in several important particulars:

1. The high negative pressures are not obtained on the unloaded half of the bearing since it is impossible to go beyond an absolute vacuum.

2. We never have bearings of infinite length and the complicated type of flow pattern resulting from end leakage in the finite bearing renders the mathematical solution correspondingly difficult. The heat generated by the work done shearing the oil film lowers the viscosity of the lubricant as it passes through the bearing and again not in a simple manner. Deformation of the bearing can also result from local heating, or ordinary loads.

3. Many types of grooving and oil feed are employed, each of which has its own characteristic pressure distribution and consequent change in load capacity.

4. Faulty alignment of shaft and bearings or deflections under load have a very pronounced effect on safe load and heat generated and cannot be analyzed directly.

Since there is no side leakage in a bearing of infinite length the pressure distribution around any section perpendicular to the axis of rotation is the same. Figure 8 shows the developed surface of an experimental bearing in which several lines of equal pressure are drawn. Several significant conclusions can be drawn from this. The figure shows that the point of maximum pressure across the bearing is very nearly in line with the load, indicating that the point of minimum film thick-

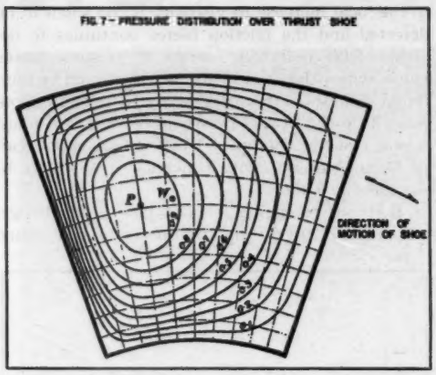


FIG. 7 - PRESSURE DISTRIBUTION OVER THRUST SHOE

ness is not in a horizontal plane with the bearing center but rather makes an angle of approximately 45 degrees to the line of loading. This is also shown by the location of region of negative pressure since negative pressure could not occur in the converging wedge. The small area covered by the region of negative pressure shows a great deviation from theory. It will also be noticed that the equal pressure lines are not symmetrical with respect to the center line of the bearing. This is due either to deformation of the bearing by heat or load or by an unsymmetrical application of the load.

The heat generated by the oil shear is of major importance in most practical bearing applications. This heat can be removed only by conduction to the journal or bearing, or by the oil. In many cases such as most automotive crankshafts, the bearing parts bring additional heat from external sources so that the lubricant then becomes the only coolant. When the generation of heat becomes so great that the consequent decrease in viscosity results in a dangerous condition, a high viscosity index oil must be used or the bearing must be water-jacketed, thus largely removing the cooling function from the lubricant. Where this cannot be done, the lubricant itself must be introduced in large enough quantities that the excess above that required for maintaining the film can be used to carry away the excess heat.

Figure 9 shows a form of groove very frequently used in automotive bearings. It has been stated by some that because area is reduced by the groove such a bearing cannot carry as much load as an ungrooved bearing of equal overall length. This would be true if the viscosity decreases through the bearing were kept the same. At *a* is shown the lateral or axial distribution without the circumferential grooving; *b* shows the conditions

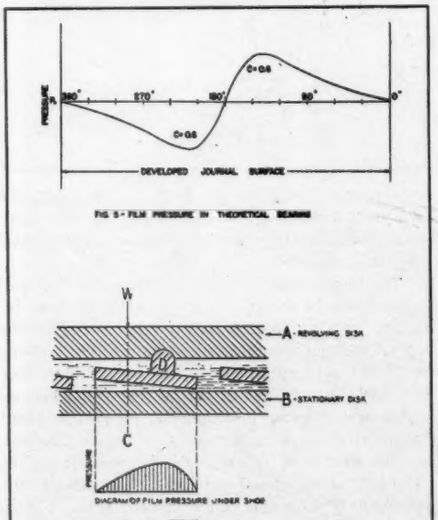


FIG. 5 - FILM PRESSURE IN THEORETICAL BEARING

DIAGRAM OF FILM PRESSURE UNDER SHOE

FIG. 6
PRINCIPLE OF KINGSBURY OR MICHELL THRUST BEARING

with the same viscosity, the same flow, and the same reduction in viscosity for the grooved bearing. However, with the same supply pressure the mean flow path of the lubricant has been greatly reduced. The flow is increased and, as the heat is carried away more rapidly, the viscosity does not drop so much and the pressure moves up as shown by the solid line *c*. Consequently the load capacity may be much greater for the grooved bearing than for the plain bearing. This form of groove readily responds to increase of supply pressure.

Many other forms of grooving or oil feed are in use and most of these require experimental study before much can be said definitely about their relative merits. The general opinion fairly well authenticated by experience is that the oil supply should preferably be on the unloaded side near the entrance to the Reynolds wedge. At any rate, the oil supply should never be at a point where the film pressure would normally be greater than the supply pressure and distribution grooves should not be placed across the bearing in this region.

The greatest difficulty in the way of rigorous mathematical solution of bearing problems is that no change can be made in any one of the factors—

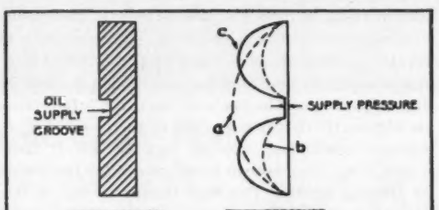


FIG. 9
BEARING WITH CIRCUMFERENTIAL GROOVE

speed, load, clearance, eccentricity, viscosity, viscosity index, heat removal, or grooving—without at once affecting all the other factors in some degree. In short, any change in one of the factors upsets the equilibrium of the system and the solution for the new equilibrium conditions is a matter so difficult that the mathematicians have wrestled with it for more than 40 years and have not got much beyond an imaginary bearing and a lubricant that does not exist. The engineers have certainly not done their part yet, as they have often been guilty of extremely loose thinking about bearing behavior. They insist on riding hobbies in design and they have not made anywhere nearly enough tests to give the mathematicians a fair starting base. However, in the last five years more has been done to remedy this condition than in the previous thirty.

From the foregoing it is plain that the first difficulty in reaching theoretical load capacities lies in the definite length of bearing, the limitation of which we cannot, by any practical device, avoid. There are for each type of oil supply, optimum ratios of length to diameter which give the best results. These have been found for some of the cases by means of the side leakage factors developed by approximation methods to apply to the infinite length formulae.

The next most important difficulty is that with all known lubricants viscosity varies with temperature. It is clear that for all bearings in which the lubricant removes all or part of the heat, a liquid whose viscosity did not vary with temperature would solve most of the difficulty. Since such a lubricant is not to be found and is not likely ever to be found, we can reduce the heat effects by: (1) Using an oil of high viscosity index; (2) increasing the flow through the bearing by a suitable grooving or increased supply pressure, or both; (3) providing a separate cooling system in which case the viscosity index of the oil will be

of little importance since by design the temperature would be held practically constant by the jacketing.

Boundary Lubrication

Hersey sometime ago found that if the coefficient of friction were plotted against a dimensional operator (the product of viscosity and speed in revolution per minute divided by load per square inch) a very useful plot could be obtained. Such a curve is shown in Figure 10. By this method all the results of tests on a single bearing fall on the same curve regardless of the load, speed, or viscosity. There are some decided limitations since the plots for different bearings do not coincide and the mean viscosity is difficult to determine. Nevertheless, it can be used as a means for showing the point at which boundary lubrication is reached, that is, when the experimental points leave the straight line or low values of ZN/P and begin to rise sharply.

It will be noted that in the discussion of the perfect film condition the only property of the lubricant itself involved was viscosity, but it has long been known that certain oils could carry a bearing farther into the boundary lubrication region without failure. This characteristic, christened "oiliness," is defined as "that characteristic of liquids in lowering of friction by the surfaces moving relative to one another and which cannot be accounted for on the basis of viscosity." Referring to Figure 10, this means that it moves the line of friction coefficient plotted against ZN/P from a to b. Two theories can be advanced for the action of oiliness agents. The first theory is that it is a selective absorption on the surface of the metal of a film which is only a few molecules thick. When the clearance, because of increased load or reduced speed, becomes sufficiently small so that these two films meet, it is the same as if a more viscous lubricant (more like a grease, say) were used and the bearing will carry additional load. This theory appears to be contrary to some of the facts. If the film acted as a plastic, the coefficient of friction should increase instead of which it decreases to an appreciable extent. The physicists claim that the thickness of the film cannot be sufficient to give the effect required by this theory. Another variation of this adsorbed film theory is that the film prevents approach of the metallic molecules of the journal and bearing to the point where cohesive forces are brought into play.

The other theory is based on the increase of viscosity of petroleum oils with pressure. It is known that the viscosity does not change much with pressure at moderate pressures, but at high pressures it may increase very rapidly. On the other hand, some at least of the known oiliness agents have a much more rapid increase of viscosity with pressure. Lard oil, for example, will even change into a solid at quite a moderate pressure. In a bearing approaching boundary conditions, the roughness of the surfaces become extremely important because the peaks of the irregularities may be of the same value as the minimum clearance, in which case the high spots on each surface tend to hit and break the film. At these points which will be a very small percentage of the total surface, very high local pressures will occur. With an ordinary petroleum oil these high pressures will disrupt the film at the localized points. Points come into contact and start to abrade naturally raising the resistance to motion and consequently the apparent friction coefficient. If an oiliness agent is present, its rapidly increasing viscosity due to the local high pressure approaching the bump converts the oil possibly into a grease-like solid which has high enough resistance to flow to prevent film breakdown.

Since these local points as indicated above have very small total area, the increased shear due to the local increase in viscosity is too small to be detected and the friction factor continues to decrease with reduction on ZN/P to some lower value, where, because of further reduction of minimum clearance, there are many more high spots ready to touch. Local pressures become still more severe and the remaining local "grease spots" can no longer furnish enough increase in viscosity to support the loads.

Both the foregoing theories lack proof. Kingsbury proved 20 years ago that down to a clearance

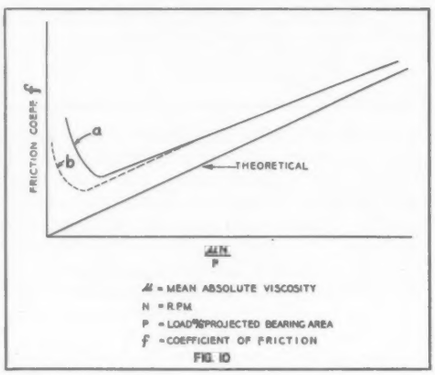


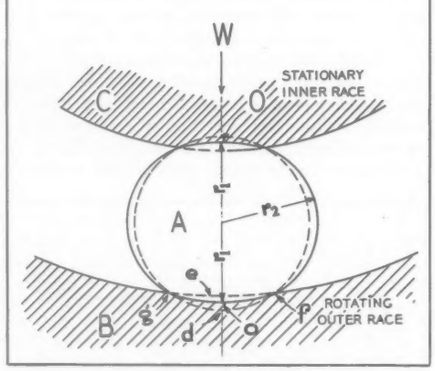
FIG. 10

of 25 millionths of an inch a bearing still followed the hydrodynamic theory. Later experiments have claimed to prove the same thing down to 10 millionths of an inch. The second theory is probably nearly right as it appears to agree with the test results on friction factor produced by oiliness agents.

Roughness of Bearing Surfaces

From the consideration of the foregoing, it appears that when loading has reached a point where the metal surfaces are about to touch, or do touch, another physical characteristic of the bearing—roughness of surfaces—becomes extremely

FIG. 11
CONDITIONS IN ROLLER-BEARINGS UNDER LOAD



important, in addition the material of which the two parts are made also becomes quite important, on account of difference in behavior when contact does take place.

The importance of smooth surfaces is now well recognized; in the past few years reamed or burnished bearing shells and polished crankshafts have almost eliminated the period of slow driving or breaking in automobiles. In the cylinder, honing, and, latterly, provision of oxide of films on piston and rings as conditioners (like soft lapping) have cut down cylinder break-in time. The successful advent of roll-neck bearings such as the "Morgoil" design has been largely traceable to improvement in fit and finish of surfaces, coupled with a high flow to keep up viscosity throughout the bearing. This bearing permits oil lubrication where formerly only greases were generally (though only partially) successful.

Bearing Materials

As mentioned above, the materials of which bearings are made is of importance, chiefly from the way they may behave at the point of failure. The widespread use of babbitt metal, probably the most widely used of all bearing alloys, is chiefly because it may partially fail without taking the bearings out of service, and, in case of failure, does not damage the shaft with which it is in contact. Many combinations of tin, lead, copper and antimony are all called babbitt, varying from 91 per cent tin and no lead, to no tin and 90 per cent lead. Those above about 65 per cent tin are tin-base babbitts, those above 60 per cent lead are lead base. The high grade babbitts are all tin base.

The melting point is low and, as a consequence, when the lubrication film is broken by too high load or too low speed for the load, the local high temperature may melt some of the babbitt, resulting in "wipe." If detected in time, by rise in bearing temperature, the bearing can be saved from failure, and operation successfully continued under reduced load. The wipe may partially correct itself by plastic flow and polishing, so the bearing need not be repaired immediately. Tin-base babbitt is among the least active alloys with hot oil, and corrosion is, therefore, practically unknown. At high loads and especially under impact or shock loading, babbitt may crack, or flow, as its compressive strength is rather low. As a preventive, when working near the limit of this material, the babbitt from one-sixteenth to one thirty-second inch thick is sweated to steel or bronze backs. Babbitt may be used against soft steels. . . .

Cadmium-silver and cadmium-nickel alloys have in the last two or three years attained considerable use in automotive crankshaft bearings. They are used in very thin layers on steel or bronze backs, will stand considerably higher pressures than babbitt, but are the most easily attacked by corrosion in hot, uninhibited oil.

At the present time, copper-lead alloys and the cadmium group, chosen to cover higher load conditions, have brought in about as much trouble from corrosion, as they eliminate in bearing failure due to overloading. No very good case has yet been made out, and most engines, particularly those of better grade, still manage quite well with babbitt. . . .

Grease Lubrication for Sleeve Bearings

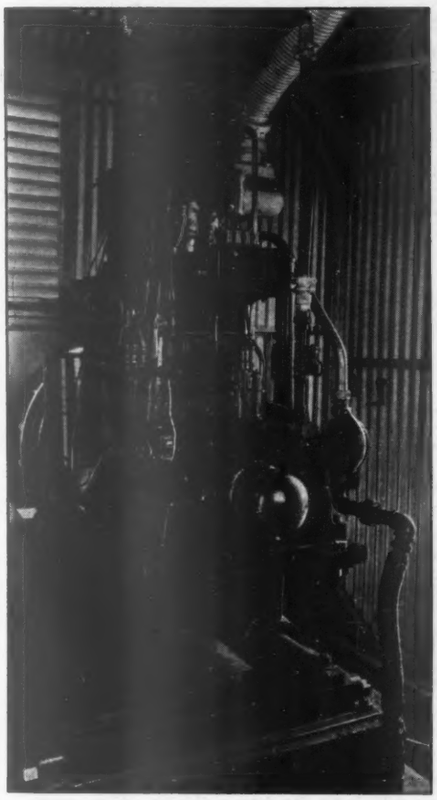
It appears not to be generally known that a plastic material like grease when in motion, behaves much like a liquid; indeed, at high shearing rates, corresponding to high surface speed in a sleeve bearing, a grease behaves exactly like a liquid. From the standpoint of lubrication, about the only reason for employing grease is to obtain a higher effective viscosity in the bearing than can be obtained with oil. The use is therefore confined (as a lubricant purely) to those bearings running at low surface speed, and high load. Examples are locomotive crankpins, old style roll necks, and pivot bearings of cranes and turntables. Put another way, grease is good where the "squeeze out" is high and the "drag in" low.

There is, however, another important property of grease—its ability to stay in an exposed bearing with much less loss than oil. For this reason, grease must be employed for many bearings where supply is by occasional hand filling, and where exposure to weather, water, etc., would wash out an oil. . . .

Grease may also be essential for those bearings subject to considerable heat, where an oil cannot be kept viscous enough under the operating temperature to handle the bearing load.

(Continued on Page 266)

OPERATING IDEAS

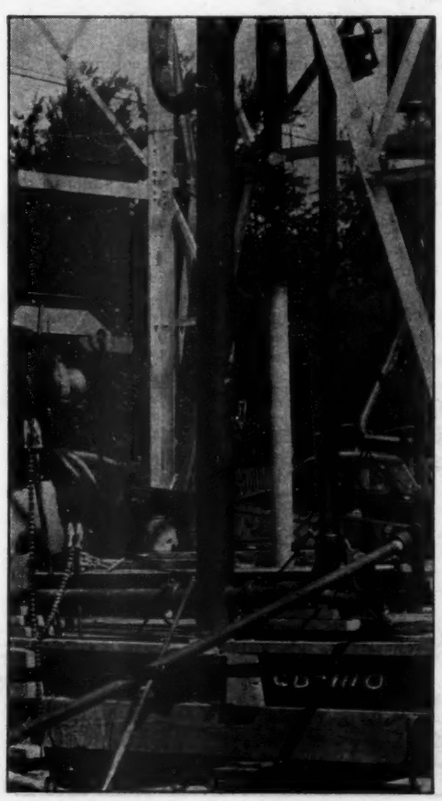


Flexible Connections

A floating base makes it possible to use the weight of the engine for belt tightening. At one installation, equipped with such a base, difficulty due to loosening of exhaust and intake pipes has been overcome by flexible connections; flexible metal hose is used on the exhaust; rubber hose is used on gas line.

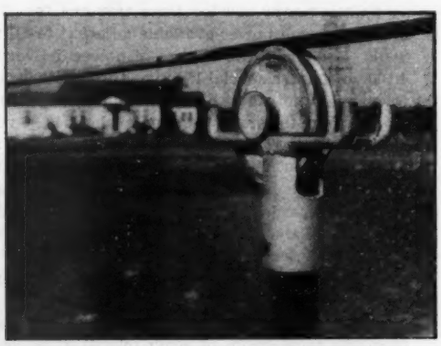
Air-Chamber Supports Mud Line

With the introduction of power pumps, larger air-chambers became necessary. Some of these are attached directly to the pump but for the most part they are located on the mud line just in front of the standpipe. They are generally made of 6-inch pipe, from 10 to 30 feet in length. Most operators simply put a "T" in the mud line into which is screwed a short nipple and a half union. The other half of the union is screwed on the bottom end of the air-chamber. Consequently, all the weight of the air-chamber rests on the mud line. This drilling contractor has designed his air-chamber to support the mud line. Instead of swaging the air-chamber down to 3 inches, he simply sealed up the end of the 6-inch pipe, which sets on the floor, and welded two 3-inch nipples on opposite sides of the air-chamber.



Protected Electric Cable Reel

A portable reel has been designed and built by a drilling contractor in Oklahoma City to hold the cable of a Diesel electric rig. When the rig is moved, all electric cable is rolled on the double reel, which has been built to protect the cable against accidental damage and exposure to the weather. Construction is of the light, sturdy kind suitable for portable equipment.

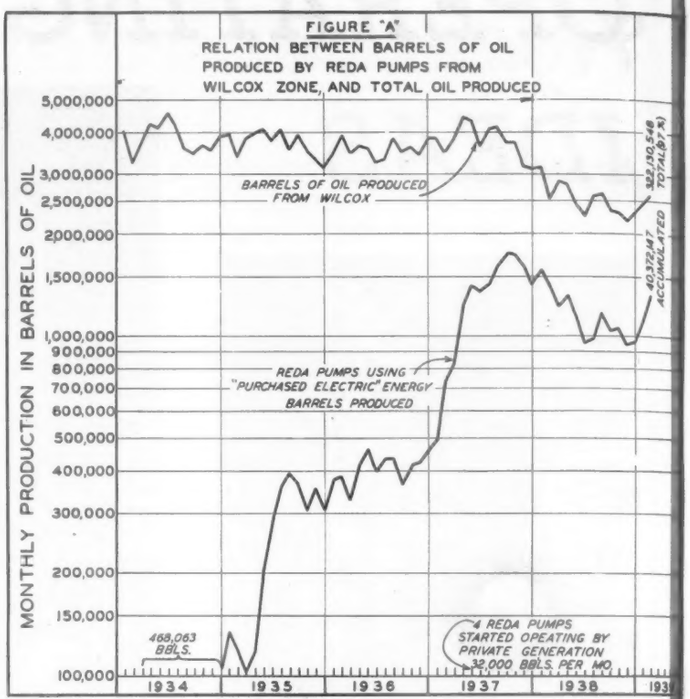


Rolling Support Aids Rod Line

Turned from a block of hardwood, a type of homemade rod-line support has been put in service in East Texas which reduces maintenance and eliminates the need for periodic lubrication. The roller supporting the rod line is made with flanged hubs, which ride on two rails, consisting of short sections of sucker rod. The ratio between the diameter of the large groove on the support and the two flanged hubs is such that the travel of the roller on the sucker-rod rails as the hubs revolve is equal to that of the rod line over the large pulley. With the sucker-rod rails mounted on a pipe bracket, slotted to afford pulley clearance and fitted with set screws for adjusting as to height, on the usual pipe post, adjustment of the supports is easy; spacing of the pulley on the rails is automatic as the rod line moves backward and forward.

Power Consumed by Reda Pumps in Oklahoma City Field

By W. H. STUEVE
Oklahoma Gas & Electric Co.



Recent reports of the Corporation Commission of Oklahoma, as of January 1, 1939, show the total recovery in production of the Oklahoma City oil field as amounting to 443,088,298 bbls., of which amount the prolific Wilcox zone contributed 317,031,492 bbls., or 71.5 per cent during the 10-year life of the field.

At the present time, however, the Wilcox zone is allowed to produce 82.2 per cent (January, 1939) of the total production in the Oklahoma City field, and during February, 1939, the Wilcox zone will produce almost 85 per cent of the total production of this field.

Utility power service lines traverse the field and make such power available adjacent to all the wells. Ordinarily the voltage of power delivery is 4,100 volts and a special 150-kva., three-phase transformer is supplied with the Reda pump and motor to step down the supply voltage to about 1,000 volts at the surface on the cable. Since practically all, or 98 per cent, of the Reda pumps in use in the field take their power service from the utility lines, and the records of such meter readings being readily available, it is possible to obtain the total amount of energy consumed by Reda pumps for the entire period of time from March, 1934 (the original installation) to this date.

From such meter readings, when considered from the total group of Reda pumps, it is easily possible to arrive at an average amount of electrical energy which is necessary to lift a barrel of fluid to the surface and into the tank batteries, which average energy required in terms of kilowatt hours per barrel, when divided into the total energy sold, would give a fairly close approximation of the actual fluid lifted or produced. It was recognized that it would be an almost interminable task to obtain the actual production from individual leases for the period of 10 years, or even during the five years in which Reda pumps were used—from 1934 to 1939; however, certain deductions could be made from recent monthly operating data to arrive at a fair average figure of energy per barrel, which in turn could be used for the entire interim explored. Factors which influence the selection of the average amount of energy required to lift a barrel of fluid may be enumerated as follows:

(*a*) Size of Reda pump used and its efficiency.
(*b*) Amount of water being pumped with the oil.
(*c*) Amount of gas produced with the water and/or oil.
(*d*) Depth from which pumping is accomplished.
(*e*) Draw-down of the standing column of fluid.

Distribution of Pumps

At the present time (January, 1939) there are 139 Reda pumps producing from the Wilcox formation and about 35 from the lower Simpson formation, and the production of water and oil is shown in Table 1, along with electric energy used.

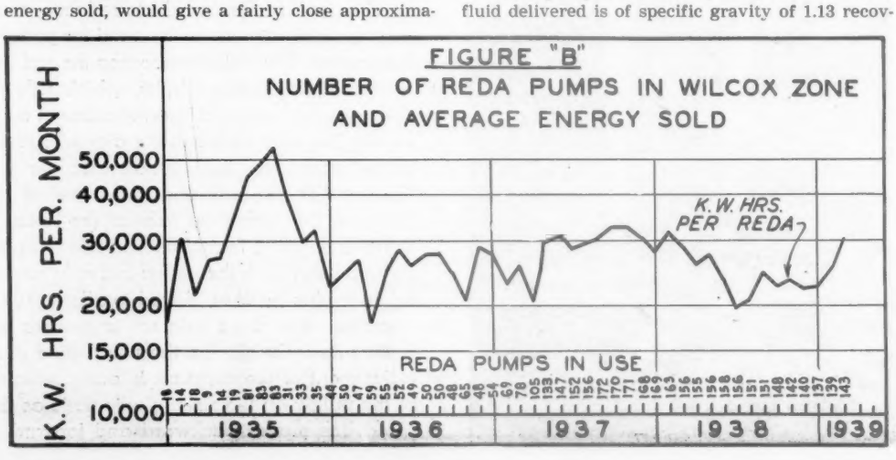
In reviewing Table 1, it is noted that the energy required to lift a barrel is approximately the same for all the pumps in the field as it is for those (139) pumps in Wilcox-sand wells. However, in the case of all the pumps for the total field, one-half of the fluid delivered is of specific gravity of 1.13 recovered by pumps having an over-all efficiency of about 40 per cent; whereas, the 139 pumps used in the Wilcox zone delivering fluid of average specific gravity of .88 have an over-all efficiency slightly lower. Therefore, it would seem that to obtain an unbiased and fair estimate of the production of oil from the Wilcox zone, the amount of fluid could be arrived at by dividing the total energy sold each month to those Reda pumps located in the Wilcox zone area by a factor of 3.2, derived from Table 1, to arrive at the total production of oil during that month.

These meter readings, for Reda pump stations located in the Wilcox zone, have been assembled by months from the date of the first Reda pump installation made in March, 1934, to and including February, 1939, or a total of five years. This information is set out in Table 2 for the interim mentioned.

Figure "A" is shown for the period 1934 to 1939 to illustrate graphically the relation between oil produced from the Wilcox zone by operating Reda pumps and the actual total oil produced from this area. Note the gradual acceptance of this method of pumping by the producers.

Also, from Table 2 it is noted that slightly more than one-eighth of this total production from the Wilcox zone, from the discovery date 10 years ago, has been produced with Reda pumps; further, in the last five years almost one-fifth of the total oil produced from this prolific Wilcox area has been made possible by the use of Reda pumps, whereas today, or during the last several months (January and February, 1939) it can safely be said that almost one-half of the total Wilcox production is achieved by using "purchased utility power" to operate Reda pumps.

Some consideration should be given also to the fact that there are today possibly six Reda pumps operating in the Wilcox zone whose duty is to lift the oil only from the formation up 500 to 1,000 feet, where it is then produced by gas lift the remaining distance. A great amount of actual production was achieved by this combination lifting method during previous years incidental to taking potentials. Values as low as .5 to .9 kilowatt-hours per barrel of oil were realized during this period, which, if properly accounted for, would probably increase the amount of recovery by Reda pumps from the Wilcox zone during the last five



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"BOSS"
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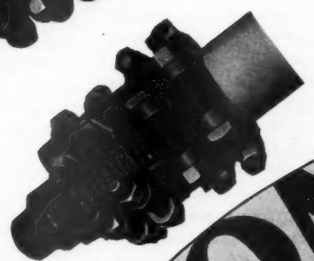
1923
"BOSS XX"

1925
"BOSS DUPLEX"

1928
"BOSS TRI-DUPLEX"
STYLE T-D



1934
"BOSS GIANT
TRI-DUPLEX"
STYLE Z

Here it is—the new "Dixon" Built-In Rotary Hose Coupling—backed by 22 years of leadership in the development of hose couplings for the oil producing industry.

Knowing that Dixon has always led the field in the improvement of Rotary Hose Couplings, you will naturally expect this newest Dixon product to be *way in advance* of any other coupling of the "built-in" type. It is! In both design and construction, it represents a decided departure from the common practice of a frictional or compression anchorage.

Consisting of three major parts—body, segments and head—the "Dixon" Built-In Rotary Hose Coupling is readily and simply applied to any standard make of rotary hose, lending itself naturally to the reinforcing members of the end section of the hose and coupling proper.

The definite advantages of this new "Dixon" Built-In Rotary Hose Coupling are immediately apparent. Smooth, uninterrupted flow throughout entire hose and coupling, giving greater volume of fluid at tool and also reducing vibration. Natural reinforcement for end section of hose. No coupling leaks—hose is mechanically anchored to coupling body by looping and clamping of wire members. Completely adaptable to any standard rotary hose. Considerably lighter in weight than detachable type couplings. Head portion of coupling is replaceable without damage to hose or coupling body. No back leaks in the hose body to rust out metal members.

The new "Dixon" Built-In Rotary Hose Coupling will be demonstrated at the Oil World Exposition, Booths 533-535, Houston, April 24-29. Be there—and get all the facts about the Rotary Hose Coupling you've been waiting for!

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"The DIXON" BUILT-IN

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years to perhaps 25 or 30 per cent, instead of 19.9 per cent as computed from Table 2.

Since this survey attempts to show only abstract information as to actual production made possible by the use of Reda pumps, no tangible evaluation has been made of the economic advantages accruing to the producer who hazarded the purchase of Reda pumps during the early stages of its development.

The problem facing the producing industry operating in the Wilcox zone, after the discovery of the North Mansion area early in 1936, was the low bottom-hole pressures existing throughout this entire formation, which made "gas lifting" almost impossible for either producing or potential taking. The Reda pump answered the prayers of the producer to overcome this handicap of low bottom-hole pressures and no standing column of fluid in the hole.

Wells in this area that could not be produced on gas lift at all, but on the "beam" could be made to produce perhaps as high as 500 bbls. per day, were produced with Reda pumps in combination then with gas lift to as high as 5,000 bbls. per day for short periods in establishing potentials resulting in allowables of perhaps 1,000 bbls. per day. Daily allowables usually were based on from 10 to 20 per cent of the potentials.

From one viewpoint, therefore, it may be said that the Reda pump has contributed somewhere near 150,000,000 bbls. of oil more to the industry than could otherwise have been obtained during the last five years. In terms of revenue, with oil worth $1 per barrel and a complete Reda pump installation worth $10,000, it may be said that with an investment of only $1 in equipment the realization has been $100 in increased production, based on 150 Reda pumps being sold.

As further proof to indicate the reliability of Reda pumps as to actual performance in the field, there is offered Figure "B," showing the Wilcox zone energy consumed per Reda pump per month in kilowatt-hours for the period 1935 to 1939, or four years. Underneath the graph is shown the number of Reda pumps in use during each month.

From the graph in Figure "B," note that during the year 1935, the Reda pumps were used apparently in comparatively few wells, perhaps 25 in number average, but the hours operated per month approached 540 hours each, leaving comparatively little time for making repairs.

For the three years 1936, 1937, and 1938, the energy consumed per Reda pump per month remained fairly uniform and averaged about 25,000 kilowatt-hours, which means an average monthly operating duration of about 250 hours each, or in terms of production about 8,000 bbls. average per well per month.

A study of the Corporation Commission's monthly reports indicates that practically all wells having allowables of 8,000 or 10,000 bbls. per month and greater are being produced with Reda pumps. This must mean that producers cannot obtain their allowables with beam forms of lifting, when such allowables are much greater than 200 to 300 bbls. per day after allowance for small water intrusion.

Another observation from Figure "B" is noted to indicate the dependence the producer places on the Reda pump, for in 1938 with the number in use and connected almost constant, the energy per pump falls off or increases as the allowable production is decreased or increased. This effect is particularly noticeable during the cut-back in early 1938, and later the 10 per cent increase allowed in January, 1939, and a further increase of 5 per cent in February, 1939.

Other uses of Reda pumps not previously mentioned in the Oklahoma City oil field are the pumps operating in the lower Simpson formation.

Wells in that formation produce as much as 1,200 to 1,500 bbls. of fluid per day from depths of 5,000 to 5,500 feet. The electric energy required per barrel of oil produced may reach 15 kilowatt-hours in some cases, due to the necessity of handling great amounts of water along with the oil, yet, this method is the only satisfactory one and apparently is proving economical to the producer.

Thus, with Reda pumps installed in about one-fourth of the wells in the Wilcox zone in the Oklahoma City oil field, almost one-half of the total production from this formation is obtained with these units today.

All statistical figures given herein for values of oil production represent only 97 per cent of the actual production, due to pipe line deduction of 3 per cent to allow for b.s. and w.

TABLE 1—ELECTRIC ENERGY PURCHASED AND BARRELS PRODUCED IN JANUARY, 1939

Number of Reda pumps	Barrels produced (sp. gr.*) 1.15* Water	.85* Oil	Fluid	Approximate average pumping depth, feet	Total electric energy consumed, kw.-hrs.	Kwh. per bbl. fluid	Kwh. per bbl. oil	Producing formation
178	939,840	1,158,411	2,098,251	5,300 to 6,400	6,161,434	2.94	5.32	All
139	107,219	1,103,561	1,210,780	6,400	3,531,394	2.91	3.2	Wilcox

TABLE 2

Year—	Wilcox formation: Total electric energy sold, kw.-hrs.	Maximum number of Reda pumps in operation: Month	Number	Actual oil production in bbls. of Wilcox zone by Corporation Commission reports	Estimated production in bbls. of Wilcox zone by Reda pumps basis (Table 1) 3.2 kw.-hr./bbl. oil
10 months in 1934	1,497,800	Dec.	18	39,450,764	468,063
1935	9,658,297	Dec.	44	44,447,319	3,018,219
1936	15,696,586	Oct.	65	43,076,867	4,905,183
1937	50,180,370	Aug.	172	45,628,117	15,681,366
1938	44,316,343	Jan.	163	30,575,116	13,848,858
2 months in 1939	7,841,464	Feb.	143	5,099,056	2,450,458
Five years' total	129,190,860			208,277,239	40,372,147
Production in Wilcox zone prior to March, 1934				113,853,309	
Estimated production of four Reda pumps using private generated power, plant installed May, 1937					700,000
Ten years' total to March 1, 1939				322,130,548	41,072,147

Brief Observations From Table 2

Percentage of production from Wilcox zone by all Reda pumps since discovery	12.8
Percentage of production from Wilcox zone by all Reda pumps in last five years	19.7
Percentage of production from Wilcox zone by Reda pumps using "purchased power" in January and February, 1939 (two months)	48.0

Oil and the Bearing

(Continued from Page 260)

The term "antifriction" bearing should never have been used. It is misleading. The ball bearing or roller bearing has low starting resistance, and the torque is ordinarily not much affected by speed or size. But if used for high speed, heavy loads, where the friction heat requires a liquid lubricant in quantity to act as a coolant, the friction losses may be several times those for the corresponding sleeve bearing. The rolling friction occurring with ball and race contact is plain from Figure 11. The ball *A* under load, and the races *B* and *C* take each an indentation under the load *W*. The uncompressed or free shape of the ball and race is shown dotted through points *d* and *e*. The relative amount of compression of each of the parts is determined by the shape of the race and the modulus of elasticity, resulting in an actual contact line at *o*. There is no slip at o, but because of the radius, r_1 at *o*, is *less* than the radius r_2 anywhere else on the ball, the surface velocity is slightly greater as we travel from point *o* to point *f* or *g*; similarly in the race the compressed-position radius at *o* is greater than the unloaded-position radius at *f*, and the surface velocity of the race is slightly *lower* than at *o*. As a consequence, there is an increasing slip between *A* and *B*, as we travel either way from *o*. The same sort of action occurs between *A* and *C* except that the slip is less. . . .

The second type of loss is largely due to the ball or roller edge, and is also viscous shear type. The cage usually fits quite closely around the ball or rollers; the relative motion gives rise to oil shear the same as in a sleeve bearing. From this point of view, provided the load requirements under the ball are satisfied, the viscosity should be kept low, since these viscous losses, and consequently the heat generated, increase in proportion to viscosity and as the square of the speed of rotation.

The third type of loss occurs only in a bearing which is flooded with lubricant, or with a grease that flows readily and will not channel, so it gets in the way of the balls in excess of the slip-lubrication requirements. This loss is of the turbulent type, increasing as the cube of the speed because the motion of the balls and the cage paddles the lubricant around like a hydraulic brake, and is largely independent of viscosity. It is this third element of friction that gives rise to the high losses in flooded ball bearings at high speed.

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QUESTIONS ON TECHNOLOGY

By Charles K. Francis, Ph. D., Technical Editor

Temperature Corrections for Hot Asphalt and Heavy Oils

What is the correct formula for correcting the volumes of hot asphalts, above 200° F. to 60° F.?—E. A.

The National Bureau of Standards has investigated the thermal expansion of asphalts and prepared a table of factors by which volume corrections may be made from 0° to 500° F. The data were calculated from the equation:

$$V_t = V_{60}\,[1 + A\,(t - 60) + B\,(t - 60)^2],$$

using $A = 0.000341$ and $B = 0.0000001$, which is equivalent to:

Temperature, °F.	Mean coefficient of expansion
60-150	0.00035
60-250	0.00036
60-350	0.00037
60-450	0.00038

These are average values based on measurements made within 32° to 176° F., and 60° to 400° F. The coefficients and expansions given in the table apply to petroleum asphalts with an estimated accuracy of 5 per cent, which is equivalent to: 0.1 per cent, 0° to 100°; 0.2 per cent, 100° to 200°; 0.4 per cent, 200° to 300°; 0.6 per cent, 300° to 400°; and 0.8 per cent, 400° to 500° F.

The American Society for Testing Materials has adopted a standard volume correction table for asphaltic products covering a range up to 14.9° A.P.I. gravity, in which the multipliers are from the base coefficient 0.00035, corresponding to a gravity of 6° A.P.I. The tables are based on Bureau of Standards data but are for use under industrial conditions. Extreme accuracy will require use of exact coefficient for each indicated temperature.

See the references for the details.

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Multiple Distillation Compared With the Fractionating Tower

What is the meaning of multiple distillation and how is it used in petroleum refineries? Is a multiple distillation unit the same as a fractionating tower?—T. W. B.

Multiple distillation was first applied in the petroleum industry for the separation of the several fractions of petroleum in the refineries in the form of a battery of stills, which were arranged for continuous operation. The original installations were made with the stills set on the order of a cascade, so that the oil would flow down hill, from still to still, while being heated to increasing temperatures, from the first to the last. The most volatile product, gasoline, passing off from the first, lowest temperature, kerosene from the next, then in order, gas oil and lubricating distillate. The final product, fuel oil, was drawn off from the last still as a residue. This cascade form was modified to a battery in which the stills were on the same level but the level of the liquid was suitably adjusted.

Multiple distillate has to a large extent been succeeded by fractional distillation, which is conducted by bringing the hot vapors into a dephlegmating or fractionating tower, commonly called a bubble tower. In actual practice the oil is heated while passing in pipes through a furnace and the hot vapors released to several towers. The hot vapors enter the lower part of the column, the interior of which is divided into a series of plates. Each plate is fitted with a number of caps and an overflow pipe. The overflow being fitted into the plate so as to maintain some liquid on the plate. The outlets on the caps are arranged to cause the ascending vapors to come into intimate contact with the liquid by bubbling through it. When the liquid accumulates to the capacity of the plate, the excess flows to the next lower, and hotter, plate.

The lower part of the bubble tower being at the higher temperature, the most volatile portions are those that pass off from the top of the tower. As the vapors condense within the column the liquid flows down to come in contact with the ascending hot vapors. So there is condensation and vaporization taking place on each plate. Theoretically one tower might be built so that portions could be withdrawn from the side and top of the tower to make a complete separation of the crude oil, as was done in the multiple distillation units, but mechanical difficulties and the problem of temperature control have made it necessary to make use of several towers in a complete unit. The modern still, with towers, heat exchangers and condensers, is designed to fractionate the crude oil and to crack certain portions, doing the work in a compact unit.

Reference: C. S. Robinson, The Elements of Fractional Distillation.

Questions on Petroleum Technology may be sent to Dr. Charles K. Francis, The Oil and Gas Journal, Tulsa, Okla. When a copy of the answer is desired, postage should be included.

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Natural Gas Production in the U. S. and Largest Gas District

I need to know which of the major fields produces the most gas in the United States and what is the total production?—J. W. H.

The total production of natural gas in the United States for 1936, the latest report available, was 2,167,802,000,000 cu. ft. This quantity represents the volume produced and delivered to consumers. Texas was the largest producer, 734,561,000,000 cu. ft. from 2,180 wells.

The greatest producing gas field is located in what is known as the Panhandle district of Texas. The Texas Railroad Commission reports 300,000,000,000 cu. ft. were burned in carbon black plants, 402,000,000,000 cu. ft. were distributed through pipe lines, and 130,000,000,000 cu. ft. were used in field operations.

The largest number of gas wells, 19,150, are in Pennsylvania and West Virginia is next with 12,770 wells.

Reference: F. S. Lott and G. R. Hopkins, Minerals Year Book 1938, U. S. Bureau of Mines, Washington, D. C.

Origin of Bromine Required for the Manufacture of Tetraethyl Lead

What is the chief source of the bromine which is required for the manufacture of tetraethyl lead? We are informed that large quantities of this are imported into the United States from Germany. Any details concerning the origin of bromine will be appreciated.—C. W. E.

The U. S. Bureau of Mines has recently issued a report containing the details of production of the bromine used in the preparation of ethylene bromide for tetraethyl lead fluid. The information following is arranged from this reference.

Bromine was first used in the form of ethylene bromide in 1923, with the output reported at only 783 tons in 1925. The production in 1938 was 16,760 short tons, valued at $6,651,000. The indicated increase being almost 2,000 per cent in 13 years.

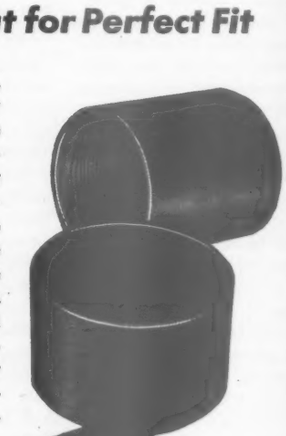
The important source of bromine is the inexhaustible reservoir, the ocean. Seawater contains 1 pound of bromine in each 2,000 gallons, which is now economically extracted by modern processes in the seaside plant located at Kure Beach, near Willmington, N. C. Last year this plant produced 818,855 gallons of alcohol and 1,343,000 gallons of ethylene dibromide. Ultimately it is expected that 22,000,000 gallons of the bromide will come from this plant each year.

Other commercial sources of bromine in the United States include the brine wells of California, Michigan, Ohio, and West Virginia. It is recovered in several other countries from brine wells, salt-works bitterns and is an important by-product of the potash industry in Palestine on the shores of the Dead Sea. No seawater plants are known outside of the United States. The value of the imports of bromine and its products was $277,527 in 1938. The main item is ethylene dibromide from Germany, imports of which totaled 605 tons, valued at $263,459 in 1938.

Reference: A. T. Coons, Nonmetal Economics Division, M.M.S. 712, U. S. Bureau of Mines, Washington, D. C.

HARRISBURG COUPLINGS

...Precision Cut for Perfect Fit



When couplings fail, leakage, waste and costly interruption of service must result. But in precision-made Harrisburg Couplings, progressive petroleum engineers secure unusual protection. These sturdy seamless units are forged individually from solid billets of special steel ...machined by an exclusive process pioneered by Harrisburg. Their strip-proof threads are unsurpassed for uniform accuracy of form, height, angle and lead.

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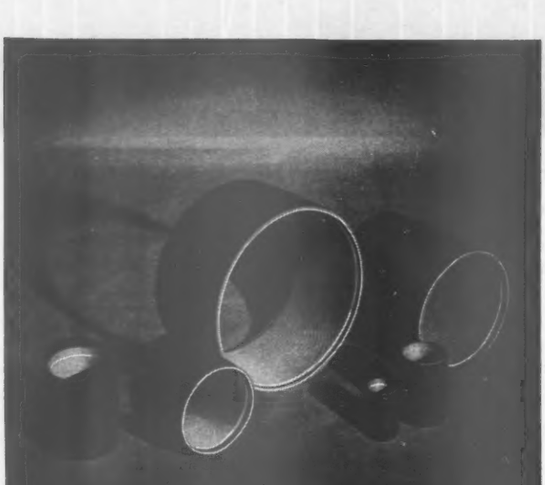


HARRISBURG STEEL CORPORATION

HARRISBURG • PENNSYLVANIA

FIELD OPERATIONS

Summarizing the Week's Developments

TEXAS: Gulf Coast—A new pool is in prospect in the Juliff area, Brazoria County. Extensions and sand discoveries in the Turtle Bay and Thompson fields in Chambers and Fort Bend counties, respectively, were features.

Southwest—A prospective pool opener was being tested southwest of the Alfred pool in Jim Wells County. A new producing area was opened 1½ miles southwest of the Benavides pool in Duval County, in Pettus sand at 5,286-98 feet. Two wildcats along the Pettus trend in Duval County were dry and abandoned, one at 5,812 feet, the other at 6,012 feet. The East White Point field was extended north and south.

West—Deep wildcats will soon be started in Stonewall, Cottle and Bailey counties, far removed from any production. A new pool is indicated by the showing in an outpost 2 miles northwest of the Goldsmith pool in Ector County. Outposts to the Bennett pool in Yoakum County and the Dean pool in Cochran County are testing favorably.

West Central—Griffin pool in Jones County was extended eastward by a 1,500-bbl. well in Palo Pinto lime. Young County's Knox pool was extended by an 800-bbl. well. A shallow pool was opened in northern Jack County at 445-50 feet.

North—Cooke County has become one of the main areas of exploration for deep production in the North Texas district, while operators in Clay, Grayson and Montague counties are also going deep in seeking oil.

East—An increase of seven in drilling wells in the East Texas field is noted, but only one well was completed. Wildcats were started in northern Henderson and Angelina counties.

OKLAHOMA—A Wilcox sand producer in the Billings pool, Noble County, flowed 2,324 bbls. of oil in five and one-half hours while pipe was being pulled. Deeper gas production was found in the Chickasha gas field, Grady County. A wildcat in Creek County, south of the Stroud pool, opened a gas pool. Testing continued at wildcats that opened productive areas in the Newalla area of Okmulgee County and the Cruce district in Stephens County.

KANSAS—Lansing lime production was uncovered three-fourths of a mile west of the Kruckenberg Arbuckle lime pool in Barton County. Lansing production also was found in the Goodrich pool, Sedgwick County, giving that area its fourth producing horizon. The Cunningham pool in Kingman, Schroeder pool in Ellsworth, Dopita pool in Rooks and Chase pool in Rice were extended.

LA-ARK-TEX—The deep oil producing rim of the Cotton Valley field was extended on the northwest edge. A wildcat in Natchitoches Parish in Section 17-10-10, was showing oil. In coastal Louisiana, the Eola field was extended 2,000 feet.

NEW MEXICO—The Loco Hills pool in Eddy County was extended 1 mile northward in Section 36-17-29. Operators were preparing to test the wildcat discovery in Eddy County, 5 miles west of Loco Hills.

MICHIGAN—A 10-cent increase in the price of Allegan and Kent county crudes was posted on April 16 by Imperial Refining Co.

Completions in All Fields

(Week Ending April 15, 1939)

	Oil	Gas	Dry	Total	1939 total comp. to date	1938 total comp. to date
N. Y., Pa., and W. Va.	39	9	4	52	908	1,378
Ohio	3	13	3	19	254	266
Indiana	0	0	0	0	41	25
Kentucky	4	0	2	6	164	214
Illinois	52	0	9	61	950	232
Michigan	10	2	20	32	330	206
Kansas	15	1	6	22	307	530
Oklahoma	23	2	10	35	507	491
Texas						
North Central Texas	24	1	18	43	644	811
West Texas	24	0	4	28	533	668
Texas Panhandle	2	1	1	4	107	196
East Texas	1	0	0	1	172	710
East Central Texas	4	1	3	8	72	108
East Texas Border	1	0	0	1	22	48
Gulf Coast Texas	20	1	8	29	386	358
Southwest Texas	40	1	14	55	673	627
Total Texas	116	5	48	169	2,609	3,526
North Louisiana	13	0	0	13	141	176
Gulf Coast Louisiana	9	0	3	12	166	145
Total Louisiana	22	0	3	25	307	321
Arkansas	5	0	0	5	69	69
Montana	2	0	2	4	36	18
Wyoming	0	0	0	0	27	52
Colorado	0	0	0	0	3	1
New Mexico	8	0	0	8	167	171
Utah	0	0	0	0	0	0
California	23	0	2	25	275	401
Total United States	322	32	109	463	6,954	7,901
Total previous week	298	40	128	466		
Week ending Apr. 16, 1938	349	33	106	488		

Outstanding Fields—Highlights

(Week Ending April 15, 1939)

FIELD—	Rigs up	Wells drlg.	Weekly oil completions	Initial prod.	Total No. oil wells	Daily av. prod.
TEXAS						
K.M.A.	34	42	4	4,385	964	24,498
Wasson-Bennett	13	35	3	5,039	267	10,192
Ector County	6	59	8	4,963	1,647	45,649
Winkler County	0	14	2	681	1,786	38,550
Howard-Glasscock	2	22	3	856	1,057	16,632
East Texas	8	24	1	35	26,028	447,000
OKLAHOMA						
St. Louis	5	21	5	1,324	804	29,750
Sac and Fox	3	11	2	462	110	3,515
KANSAS						
Barton County	4	17	3	1,542	419	13,188
Stafford County	2	10	0	0	255	7,326
Rice County	5	23	2	829	1,290	31,279
Russell County	6	22	3	858	1,213	24,495
NEW MEXICO						
Lea County	16	68	8	1,561	2,072	93,590
LA-ARK-TEX						
Shreveport, La.	4	11	4	1,345	24	3,875
Cotton Valley, La. (deep)	1	8	1	375	122	13,875
Jennings, La.	0	5	0	0	143	24,612
MICHIGAN						
Freeman-Redding	4	27	2	2,100	73	12,179
Van Buren County	8	35	4	900	187	14,216
ILLINOIS						
Central Illinois	42	322	52	8,728	2,820	155,235
CALIFORNIA						
Wilmington	4	12	4	1,581	615	87,500
KENTUCKY						
Birk City	3	11	0	0	124	2,660

Illinois and Kentucky

By STAFF CORRESPONDENT

Production in Central Area of Illinois Shows a Decline

CENTRALIA, Ill., Apr. 17.—Production in the new fields of Illinois showed a decline in the past week, the average daily crude output for the week having been 155,235 bbls. per day as against 159,737 bbls. per day in the previous week. The whole state produced an average of 163,550 bbls. a day in the past week as against 166,439 bbls. per day in the previous week.

Sixty-One Completions

Sixty-one wells were completed in the state in the past week, 52 oil wells and 9 dry holes. Fayette County, in which lies the Louden pool, had 18 new oil wells and 1 dry hole. The oil wells registered 3,418 bbls. in initial production on a 24-hour basis. In Marion County, where some Salem pool wells are only tested for three hours' initial production, the 21 oil wells produced 2,375 bbls. initially. No dry holes were reported. Two oil wells in Clinton County were good for 151 bbls. One dry hole was completed. Wayne County had seven new oil wells good for 2,209 bbls. initially, and two dry holes. A 216-bbl. well was reported from Jefferson County. Clay County had a poor week with two small wells, good for 96 bbls., and one dry hole. A 268-bbl. well was reported from Richland County, and a dry hole each from Montgomery and Wabash counties. The Matteon district in Coles County was given another set-back when a Devonian test and a Benoist test were reported dry and abandoned.

Illinois Fields

HIGHLIGHTS OF THE WEEK: The State Geological Survey in its monthly round-up of operations shows the Louden pool had 710 oil wells on April 1; Salem, 762; Centralia, 545, and Clay City, 254. These are the most largely drilled pools in the basin area. The Cordes pool in Washington County, recently opened, is just now the most interesting in the state and is receiving considerable development.

Daily production of new pools, 155,235 bbls.; old pools, 8,315 bbls.; total, 163,550 bbls.

Completed oil wells, 52; operations, including locations, rigs and wells drilling, 394.

The largest 24-hour production reported in March came from wells of the Texas Co. in the Salem field in Marion County, producing from McClosky lime. No. 7 R. Fyke, in Section 8-1n-2e, is credited with 1,750 bbls. and No. 10 Johnson in Section 5-1n-2e, was good for 1,288 bbls. W. C. McBride, Inc., in March had a well on the Fyke farm in Section 5-1n-2e that flowed 1,100 bbls. from the McClosky pay.

The Busy Cordes Pool

The Cordes pool and its environs, in Washington County, are the scene of much activity. The weekly drilling report shows American Seismograph Co. No. 1 Kasuszck, 330 feet from north and 1,307 feet from east lines of SE quarter Section 23-3s-3w, moving in rotary tools. Will core drill. McBride, Inc., No. 1 Luney, NW SE SE Section 22-3s-3w, spudding. Magnolia Petroleum Co. No. 2 Francis, 150 feet from south and 177 feet from west lines of SE quarter Section 15-3s-3w, moving in rotary tools. Magnolia No. 3 Francis, NE SE SW Section 15-3s-3w, rig up. Magnolia No. 4 Francis, 985 feet from east and 330 feet from south lines of SW SE Section 15-3s-3w, moving in rotary. Magnolia No. 5 Francis, C SE SW SE Section 15-3s-3w, rig up. Shell Petroleum Corp. No. 1 Klozak, SW NW SE Section 15-3s-3w, drilling below 800 feet. Beavers and others No. 1 Lancy, NE NE NW Section 16-3s-3w, moving in standard tools. All the foregoing were new operations. Phillips Petroleum Co. No. 1 Hunleth, NE NW NE Section 32-3s-4w, was drilling at 673 feet. J. J. Broadus No. 1 Chapman, NW cor. SE Section 35-3s-3w, had Bethel sand at 1,271 feet and was shut down for orders at 1,298 feet. The measurements are estimates as this was a "tight" hole. Lewis & Lilly No. 1 Gill and Goodner, NE cor. NW SW Section 23-3s-3w, was shut down at 1,247 feet. Shell Oil Co. No. 2 Holston, NE NE NW Section 22-3s-3w, set 4½-inch casing at 1,276 feet, and the crew was waiting for cement to set, total depth 1,297 feet. Shell Oil Co. No. 1 Holston, NE cor. NE NW Section 22-3s-3w, had Benoist sand at 1,270 feet, total depth 1,296 feet. It was shot with 12 quarts at 1,287-96 feet, and swabbed 230 bbls. of oil in 20 hours, and preparations were being made to put it on the pump. W. C. McBride, Inc., No. 2 August Weise, C NE SW SE Section 15-3s-3w, had Benoist sand at 1,231-49 feet, set pipe at 1,248 feet, and the crew was drilling plug. McBride No. 1 Weise, NW SW SE Section 15-3s-3w, total depth 1,285 feet, swabbed 16 bbls. of oil and 2 bbls. of water in 72 hours. Swabbing was continued trying to exhaust water. Manitou Petroleum Co. No. 2 Oak Grove Cemetery, SE SE SW Section 15-3s-3w, total depth 1,295 feet, was shot with 15 quarts 4 feet off bottom and swabbed 452 bbls. and flowed 342 bbls. of oil in 14 hours and later pumped 484 bbls. in 24 hours. Magnolia Petroleum Co. No. 1 Francis, SE SE SW Section 15-3s-3w, Bethel sand at 1,265 feet, set 7-inch casing at 1,274 feet, total depth 1,276 feet. Gilliam and others No. 1 Lipzenski, NE NE SW Section 15-3s-3w, 12½-inch casing set at 18 feet and shut down. Webster and others No. 1 Oexeman B, NW cor. SW NE SW Section 5-3s-3w, fishing at 375 feet. Pollack No. 1 Leibrock, SE SE SW Section 2-3s-3w, drilling at 515 feet. Thompson Drilling Co. No. 1 Rozanski, NW NW SW Section 19-3s-1w, shot with 20 quarts at 1,250-60 feet. Thompson Drilling Co. No. 1 Musial, SE SW NW Section 19-3s-1w, shot with 20 quarts at 1,247-61 feet, swabbed 30 bbls. of fluid, put on the pump, it produced water with a showing of oil, testing.

(Continued on Page 290)

Birk City Crude Price Down; McClosky Pay in New Pools

OWENSBORO, Ky., Apr. 17.—The Aetna Oil Service Co. of Louisville, effective April 8, posted a price for Birk City crude for the first time. Its price is 80 cents per barrel, or 25 cents per barrel under the posted price as of that date. On April 12 the Sohio Oil Co. (Fordsville Gathering Lines, Inc.) lowered its Birk City posted price to $1 per barrel, a 5-cent cut.

There were no completions in the Birk City field during the week, but in the Scuffletown district in Henderson County, a McClosky lime test was barren in that formation and was plugged back to the Cunningham sand. In the Reed district in Henderson County a 200-bbl. well was completed in the McClosky and a well in the same formation in the Corydon district started at 28 bbls. an hour. The upper Ohio River is again on the rampage, which is expected to slow up development work until the flood season is over.

Folowing were the completions of the week, and the new work started in western Kentucky:

Butler County, Bethel School district: E. H. Ellison No. 1 E. E. Baxter, dry hole, total depth 595 feet. Quality district: Jack Peurifor No. 2 Forgy Heirs, spudding in. Rochester district: Penn-Tuck Oil & Gas Co. No. 5 Kyle Willis, a 10-bbl. well from Jett sand, total depth 938 feet.

Christian County, 5½ miles southeast of Dawson Springs: A. J. Morton, Jr., No. 1 John Collins, abandoned at 400 feet; skidding rig to No. 2 location.

Daviess County: Birk City district: Kentucky-Missouri Oil Co. No. 1 Rebecca Boswell, derrick up; Jess Ashby and others No. 2 R. M. Hagan, rigging up; Owen & Borders No. 1 Mirilda Wahl 1A, location.

Grayson County, 2½ miles northeast of Shrewsbury: L. C. Young and others No. 1 William Dinwiddie, spudding in.

Henderson County, Scuffletown district: Palmer Drilling Co. No. 1 Oscar G. Letcher, McClosky lime dry to Cunningham sand and shot; may make a small well. at 2,103-10 feet, total depth 2,165 feet; plugged back Reed district: Spring Rose Drilling Co. No. 1 Ray Pillman, 5 feet of McClosky saturation, total depth 1,981 feet; acidized with 1,000 gallons, swabbed and flowed 32 bbls. the first hour and 200 bbls. in a six-hour test. Corydon district: Kentucky Natural Gas Co. and Sun Oil Co. No. 2 George Trigg, 5 feet of McClosky saturation, total depth 2,631 feet; flowed and swabbed 28 bbls. the first hour.

McLean County, Island district: South Penn Oil Co. No. 7 H. K. and John Kirtley, 25-bbl. well from Jett sand.

Muhlenberg County, Belton district: Fred Phillips No. 2 Clarence Boggess, spudding in. Dunmore district: J. C. Miller and others No. 1 Goode, drilling at 500 feet.

Ohio County, Davidson Station district: W. E. Hupp and others No. 3 Morgan Patterson, dry hole, total depth 975 feet.

Webster County, Sebree district: Ily Browning and others No. 3 Marion Walker, drilling at 250 feet.

EASTERN KENTUCKY

ASHLAND, Ky., Apr. 17.—One completion is included in the report of eastern Kentucky field operations this week. Activities are slower in some sections while maintaining last week's level in others.

The Inland Gas Corp. No. 206 on the Zada Hutcherson land on the Right Fork of Troublesome Creek in Knott County, total depth 1,725 feet, in Maxon sand, started with a daily production of 608,000 cu. ft. of gas.

In Knott County, the Inland Gas Corp. had reached

(Continued on Page 291)

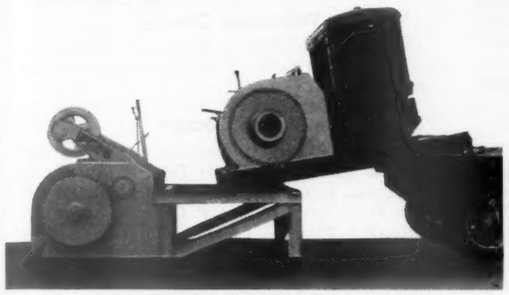
Another Model U 10 in Action

Model U 10 Three Engine hook-up loaded intact.

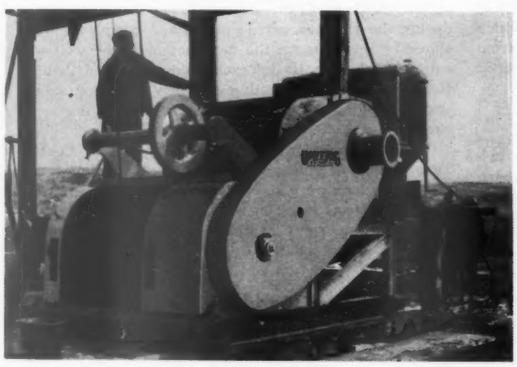
Model U 10 Single Engine hook-up can be mounted on truck or trailer.

A New Idea

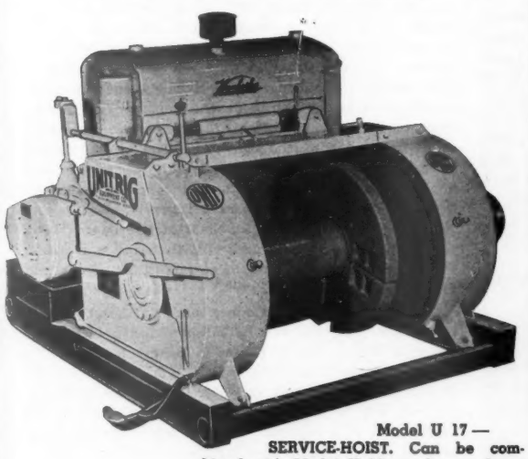
in general well servicing — the U 17 or U 18 SERVICE-HOIST, distinctly portable units, can be combined with our U 19 Auxiliary Spudder Unit anywhere — can be moved and used in one load combinations or separately. One U 19 will combine with any number of our SERVICE-HOISTS.



Model U 19 Auxiliary Spudder Unit



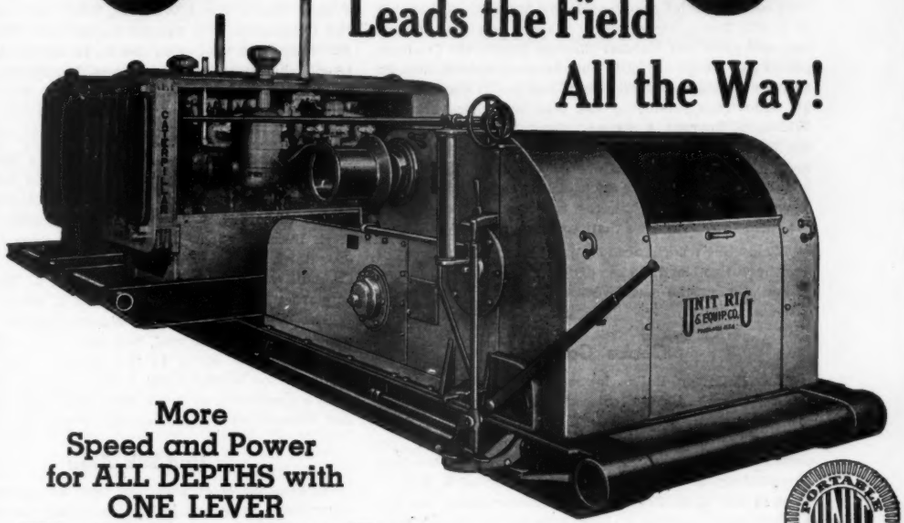
Model U 17 and U 19 Combined



Model U 17 — SERVICE-HOIST. Can be combined with Model U 19 as shown above.

UNIT RIG

Leads the Field All the Way!



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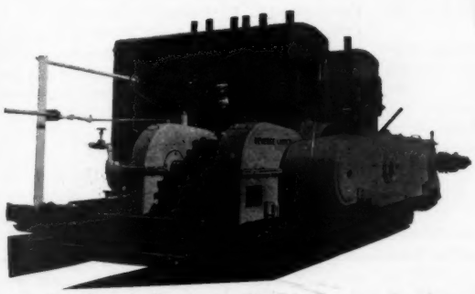

Model U 12 Reverse Clutch rotary hook-up showing dual engine drive system for conventional drawworks application.

(1) Not too little—not too big.
(2) Complete Unit can be moved intact on truck or trailer.
(3) Average rigging-up time two hours.
(4) No time lost in making adjustments.
(5) Strong—Safe—No open drives. Dust proof.
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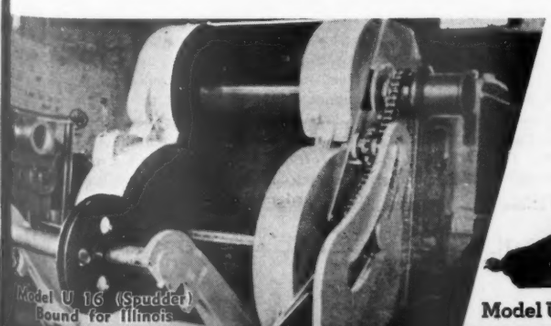
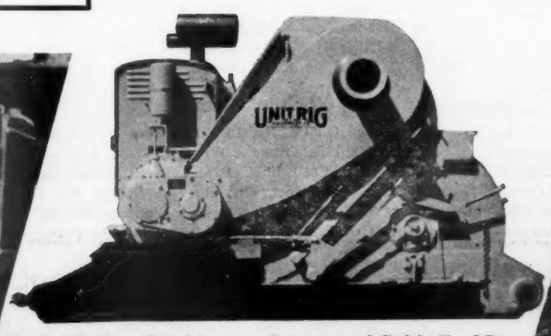
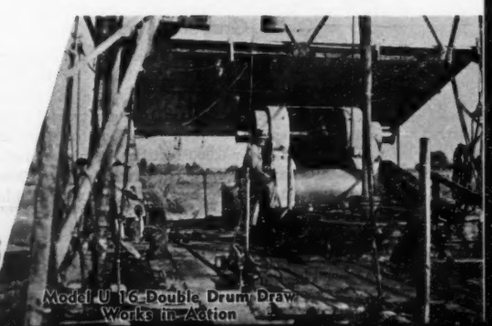


Model U 16 (Spudder) Bound for Illinois



Model U 16 — Combination Rotary and Cable Tool Rig



Model U 16 Double Drum Draw Works in Action

North and East Texas

By
D. H. STORMONT

Work Revival in East Texas; Cooke County Is Attractive

WICHITA FALLS, Tex., Apr. 17.—Staking of three wildcat operations in the past week in Cooke County, already the scene of considerable development, makes that county one of the most active areas of exploration in North Texas. Development started less than a year ago, and early last summer Sinclair Prairie Oil Co. completed No. 1 Best for 2,000 bbls. to open what is now an active and expanding oil pool. Later on in the summer an Ordovician producing gas pool was discovered by Whitfield, Pearson & Grimes about 20 miles south of the Walnut Bend area. The operators' second test in the area was an oil well and opened another pool for the county. Many tests have been drilled throughout Cooke County in the last six months, some of which have not yet yielded a verdict on their production possibilities.

Meanwhile wildcat activity gains momentum throughout the entire North Texas district. Deep wildcats were staked during the past week in Clay County and in Grayson County.

Cooke County

Tom C. Patton, Dallas, let contract to Target Drilling Co. for No. 1 J. H. Honeycutt, scheduled 5,000-foot Strawn series test about 3 miles south and slightly west of the Walnut Bend area in Cooke County. The contractor is to start moving in materials for the test immediately. It is located in the center of a 65-acre tract in the H. E. Ford Survey, Abstract 1362, Section 4, University League 4. Half interest in the acreage and the proposed test has been turned to Snowden & McSweeney, Inc., and the test will be carried as a joint operation.

K. R. March of Fort Worth has made location for No. 1 S. W. Poyner, 1,170 feet from the west and 150 feet from the north lines of the T. Wisdom Survey, Abstract 1167. This wildcat, 1½ miles southwest of the Bulcher pool, in the northwest corner of the county, will be drilled with a rotary to a projected depth of 1,880 feet.

Continental Oil Co. made location for No. 1 Mary Gwynn, 200 feet from the north and east lines of a 350-acre lease in the F. J. Lindeimer Survey, Abstract 576. Contract depth is 2,000 feet and it will be drilled with cable tools. It is on a block of 1,500 acres, 2 miles west of Lindsey, in the west central part of the county.

Cox & Hamon, who last week announced a drilling campaign for the Walnut Bend pool, are clearing location for No. 1 William Neu, east offset to the Sinclair Prairie Oil Co. No. 8 Best. The well is the first of two offsets which will be drilled, followed by a program which is expected to include a dozen additional wells.

Clay County

With one deep wildcat staked and a second proposed, Clay County had six active wildcats, and several more in the making, as the week closed to rank it among the active counties of North Texas. J. G. Beard of Houston made location for No. 1 Earl Spring, 330 feet from the south and east lines of a 40-acre tract in the southern part of Section 36, H.&T.C. Survey. The well is contracted to 4,000 feet and will seek the 3,800-foot production found in the Gant pool to the southwest.

Grayson County

A new deep Strawn sand test for the southern part of Grayson County has been staked by E. F. Strube of Fort Worth, in the Van Alstyne area, and will be No. 1 Mollie Williams, on a 192-acre tract in the Solomon Nix Survey, 3 miles northeast of Van Alstyne. Contract calling for 6,000 feet has been awarded Prince Brothers and Joe Dinger of Wichita Falls. The wildcat is located on a block of 6,000 acres assembled several months ago. Sinclair Prairie Oil Co. is reported to have shot the area with seismograph.

A second new test for Grayson County is Sinclair Prairie Oil Co. No. 1 Williams, 9,000 feet southwest of the Collinsville area opened by Mildred Oil Co. No. 1 Neathery. The well is in the R. H. Sowell Survey, between the forks of Jordan and Timber creeks. Contract depth is 5,000 feet.

Montague County

One location has been staked and a second is in the making for Montague County's deep Strawn sand pool, 1 mile west of Nocona. Rogers & Rogers, drillers of the discovery well, have staked location for No. 2 J. E. Burnett, Block 2, Jacob Lenow Survey, Abstract 433, north of the discovery well. Stanolind Oil & Gas Co. will make location for No. 1 W. L. Zachary, 40-acre tract in the west half of Block 2, same survey.

Possible extension of the shallow Bonita sand pool, almost a mile to the east, was seen in the Holcomb & Holcomb No. 1 Reed, in the Graham Survey, which was reported bailing about 2 bbls. of oil per hour from sand encountered at 2,868 feet. This pool was opened last summer by the Holmes No. 1 Bowers.

Hull-Silk Area

Unitization of acreage has been announced by two of the main operators in the Hull-Silk pool of northern Archer County. Phillips Petroleum Co. and the King Oil Co. have consolidated Lots 2, 5, 6, 9, and 10 in Block 23 and Lots 1, 3, 4, 7, and 8 in Block 26, both blocks being in the A.T.N.C.L. Survey. King Oil Co. will have charge of operations and the companies plan to start their first test as No. 1 L. F. Wilson, Lot 6, Block 23. It will be carried to 4,500 feet.

NORTH TEXAS COMPLETIONS

Archer County

Adams Oil & Gas Co. No. 1 M. B. Ray and others, 1,398 feet, dry. Bridwell Oil Co. No. 1 A. Wolf, 1,092 feet, dry. L. T. Burns No. 3 Falls County School Land, 1,172-90 feet, 5 bbls. Chapman & McFarlin No. 1 L. F. Wilson D, 3,937-4,340 feet, 720 bbls. Chapman & McFarlin No. 1 L. F. Wilson E, 4,247-4,307 feet, 1,250 bbls. Cree & Hoover No. 4 J. H. Turbeville, 1,565 feet, dry. Fresno Oil Co. No. 1 S. M. Cowan, 1,159 feet, dry. Rathke Oil Co. No. 6 C. Cowan, 1,090-1,134 feet, 5 bbls. H. A. Schaffer No. 5 W. P. Ferguson, abandoned location.

Clay County

Duncan Arnhold and others No. 8 T. P. Duncan, 1,160-1,200 feet, 75 bbls.

Cooke County

Hutton and others No. 3 F. Truebenbach, 875 feet, dry. F. W. Merrick No. 8 N. Plott, 1,344 feet, dry. F. Snuggs No. 2 L. L. Lewis, 1,185 feet, dry. Trumpter Oil Co. No. 2 J. Paulter, 1,072 feet, dry.

Jack County

Buttram Petroleum Corp. No. 1 J. W. Cullers, 2,091 feet, dry. Dunagan and others No. 1 Griffith, 365 feet, dry. G. M. Gillespie No. 3 O. Loving, 3,148-80 feet, 120 bbls. A. C. Parks No. 6 Ira Coates, 490-98 feet, 2 bbls.

Wichita County

Consolidated Oil Co. No. 19 W. P. Ferguson, 3,683-3,785 feet, 1,500 bbls. Grace & Wood No. 1 M. A. Love, 3,881-4,041 feet, 1,350 bbls. Panhandle Refining Co. No. 15 Stone, 1,851 feet, dry. Reed & Strong No. 1 Waggoner, 3,779-3,846 feet, 700 bbls. Venmex Oil Co. No. 4 H. S. Griffin A, 3,773-3,830 feet, 835 bbls. Petroleum Production Co. and Continental No. 1 A. Finkler, 5,083-5,152 feet, 31 bbls.

Wilbarger County

King Oil Co. No. 4 R. L. Castleberry, 2,642-48 feet, 565 bbls. King Oil Co. No. 9 W. T. Waggoner N, 1,417-1,750 feet, 30 bbls.

Young County

H. Craig No. 1 G. B. Hamilton, 1,150 feet, dry. Horwitz & Oldom No. 11 J. D. Lowe, 631-50 feet, 10 bbls. Horwitz & Oldom No. 12 J. D. Lowe, 674-96 feet, 10 bbls. D. W. Power No. 3 J. F. Larimore, 568-88 feet, 12 bbls. G. E. Fagg No. 1 Mrs. M. Morgan, abandoned location.

EASTERN TEXAS

DALLAS, Tex., Apr. 17.—Considerable increase in activity throughout the eastern Texas district was seen during the week as new locations and completed wells showed gains. Despite the fact that only one well was completed in the East Texas field, increased drilling is seen in that area with eight new locations staked and a total of 24 wells actively drilling as the week closed.

Eight completions were listed for East Central Texas, three of which were failures. A total of seven new operations were started in five different counties., four of the tests being in wildcat or semiwildcat areas. The most important of the new locations were the two tests staked on the Opelika structure of Henderson County.

Lower Marine Trinity Tests

The Tide Water-Seaboard-Humble partnership announced as definite its plans to drill two more deep lower Marine Trinity tests in the Opelika area of northeastern Henderson County. Operators reported that No. 1 J. H. Lewis will be drilled in about the center of a 184-acre tract in the James K. Stokes Survey, nearly a mile north of the partnership's No. 1 McGee, last completion in the area which is, itself, a mile north of the discovery well. The second test will be No. 1 Alice Scott, about the center of a 97-acre tract in the Cleveland Robb Survey, approximately 3 miles southwest of the discovery. The new locations have been so arranged as to give the structure thorough exploration and the operators are hopeful of finding oil production. The area is now generally conceded to be a distillate field, No. 1 McGee having been some 200 feet lower structurally than other wells in the area and still yielding large quantities of gas and distillate.

Also in Henderson County and northeast of the Flag Lake pool, the new Woodbine sand pool opener, Tyler & Smith No. 1 Rowe & Baker, in the J. T. Childers Survey, on first official gauge, pumped 99 bbls. of oil and 528 bbls. of water in 24 hours. Whether the well will be completed at the present depth is not known, but it is reported that the operators will plug back in an attempt to shut off the water.

Navarro Crossing

In the Navarro Crossing pool of northwestern Houston County and northeastern Leon County, Humble Oil & Refining Co. and Sun Oil Co. were reported to have staked location for No. 3 Dailey Estate, on the 1,600-acre discovery tract in the John La Reviere Survey. The new test is about 2,200 feet east of the discovery well in the field. The eleventh oil producer for the area, No. 2 Dailey, was completed by Humble Oil & Refining Co. for an official gauge of 143 bbls. of oil, with less than one-tenth of 1 per cent water. Well is

(Continued on Page 308)

Kansas Developments

By
DAL DALRYMPLE

Find Lansing Pay in Barton; Extend Chase, Dopita Pools

A Lansing lime oil pool was opened in Barton County, Kansas, at Amerada Petroleum Corp. No. 1 Merten, C NW NW Section 14-19-15w, three-fourths of a mile west of the same company's recent Arbuckle lime discovery well in the Kruckenberg pool. It found the Lansing-Kansas City horizon at 3,204-3,395 feet, plugged back depth. Seven-inch casing was set at 3,342 feet. After acidizing it made 24-hour potential of 427 bbls. of oil.

Lansing lime production also was found in the Goodrich pool, Sedgwick County, giving that field its fourth producing horizon. The discovery well was the George Fuller and Ace Petroleum Co. No. 1 Black, NW SE NE Section 21-25-1e, which made initial potential of 1,975 bbls. of oil daily at 2,280 feet, total depth.

The Cunningham hool in Kingman County was extended one-fourth mile southward at Skelly Oil Co. No. 1-E Miles, NE SW NW Section 29-27-10w. It was bottomed in Lansing lime at 3,439 feet, was acidized and made initial potential of 310 bbls. of oil.

Central Petroleum Co. No. 1 Frances, CEL E half NW Section 19-17-9w, one-half mile northwest of the Schroeder pool, Ellsworth County, made daily potential of 490 bbls. of oil from Arbuckle lime at 3,240-53 feet, total depth. It is five-eighths mile southeast of the Wilkins pool.

The Dopita pool in Rooks County was extended 1 mile northwestward at Phillips Petroleum Co. No. 1 Tanzey, C NW SW Section 25-8s-18w. It was bottomed in Arbuckle lime at 3,424 feet and made potential of 84 bbls. of oil. The outpost had been shut down for several months, but recently operators decided to rework and complete the test.

Opening of a new pool or extension of the Chase pool in Rice County 1 mile westward was indicated at Gulf Oil Corp. No. 1 Barngrover, CWL SW SW Section 30-19-9w. Oil rose 2,500 feet in the hole in five hours after drilling plug in 7-inch casing at 3,294 feet on top of Arbuckle lime. Later, it swabbed 224 bbls. of oil in nine hours, and operators continued to test.

Wildcat Developments

York State Oil Co. No. 1 Marchand, CEL NE NE Section 24-20-12w, Barton County pool opener, found pay in Arbuckle lime at 3,308-20 feet, total depth, was acidized and completed. It pumped 186 bbls. of oil in eight hours and made potential of 559 bbls. Location is about 4 miles south of the town of Ellinwood.

Paul Martin and V. H. Hearing No. 1-A Feltes, NW SW SE Section 8-16-12w, Topeka lime discovery in the Beaver area, Barton County, flowed 848 bbls. of oil in eight hours and made potential of 2,546 bbls. after acidizing and was completed. Production was from Topeka lime found at 2,680-2,906 feet, total depth. Volume of gas was estimated at 8,000,000 to 12,000,000 cu. ft. daily. Gravity of the oil was 35.3 degrees at 63 degrees. Location is five-eighths mile northwest of the Beaver pool. Nearest Topeka lime production is about 5 miles southwestward in the Ainsworth pool.

Skelly Oil Co. No. 1 Carter, CSL SW NE Section 33-14-13w, opened a new producing area or extended the South Letsch pool in Russell County three-fourths mile northwestward when completed the past week. The wildcat found Lansing lime at 2,829 feet, had pays at 2,847-53 feet and 2,861 feet, total depth 2,869½ feet. It was acidized and shot, pumped 175 bbls. of oil in eight hours and was rated potentially at 524 bbls. Location is about midway between the South Letsch and Hall pools.

C. L. Carlock No. 1 Houston, SW SE SW Section 3-31-4, wildcat in Cowley County, north of Hittle and east of the Clark pool, was rigging up rotary.

Barton County

Western Kansas Oil & Refining Co. No. 2-B Linsner, C E half E half SE Section 3-17-13w, Ainsworth pool, Barton County, had Arbuckle lime at 3,364-68 feet, total depth, pumped 508 bbls. of oil in eight hours and was rated potentially at 1,523 bbls. daily.

J. A. Rankin No. 1 Essmiller, NE SW SE Section 16-19-14w, Heizer area, was dry and abandoned at 3,550 feet, total depth.

Cities Service Oil Co. No. 1 Leuerman, NW NW SE Section 18-16-13w, Trapp district, was dry and abandoned at total depth 3,500 feet.

Sinclair Prairie Oil Co. No. 1 Laudick, SW NW NE Section 21-16-11w, Prusa area, failed to find production and was abandoned in Arbuckle lime at 3,363 feet, total depth.

Palmer Oil Corp. No. 2 Casey, C N half S half NE Section 4-16-12w, North Beaver pool, had a hole full of water and was abandoned in Arbuckle lime at 3,321 feet, total depth.

First reports of new activity in Barton County: Sinclair Prairie Oil Co. No. 5 Hoffman, NW NE NE Section 7-16-13w, moving in material; Stanolind Oil & Gas Co. No. 4 Scheufler, C NE SE Section 9-20-11w, rigging up rotary; same company's No. 19 Panning, C S half NW Section 11-20-11w, rigging up rotary; Sinclair Prairie Oil & Gas Co. No. 2 Oser, SE cor. Section 17-16-11w, location; same company's No. 2 Prusa, NE cor. Section 20-16-11w, rigging up rotary; Texas Co. No. 1 Leuerman, NE SE SW Section 8-16-12w, offsetting the Topeka lime discovery in the Beaver area, was moving in material.

Reno County

Westgate-Greenland Oil Co. No. 1 Wood, SW SW NE Section 36-22-5w, Buhler pool, Reno County, pumped 234 bbls. of oil in eight hours and was completed for 24-hour potential of 703 bbls. Production was from Simpson sand at 3,916-21 feet, total depth.

A. M. Landon and others No. 1 Union Central, SW cor. Section 7-24-10w, which gave promise of extending the Zenith pool of Stafford County into Reno County when some saturation was found in cores near top of Misener sand at 3,335 feet, failed to develop commercial production and was abandoned at 3,773 feet, total depth. Viola lime was found at 3,752 feet.

Estimated Daily Production

Estimated daily production for Kansas for the week ending April 15, and for the preceding week, was as follows:

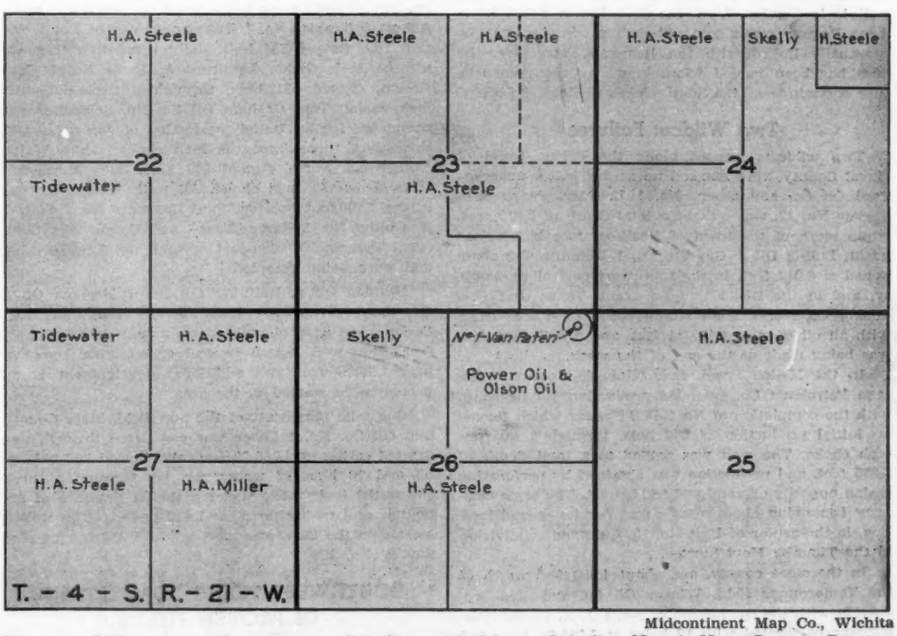
	Bbls. Apr. 15	Bbls. Apr. 8
Oxford City	1,050	1,025
Burrton	8,625	8,775
Ritz-Canton	5,850	5,775
Graber	3,475	2,175
Hollow-Nikkel	3,075	3,125
Lerado	650	675
Voshell	1,825	1,775
Wellington	2,325	2,275
Ellsworth County:		
Lorraine	2,075	1,600
Other pools	1,440	1,160
Rice-Barton counties:		
Bloomer	2,550	2,100
Chase	4,925	3,275
Geneseo	3,800	3,050
Raymond	900	600
Silica	10,000	9,850
South Silica	2,425	1,075
Keesling	900	475
Wherry	4,075	2,825
Miscellaneous Rice	6,680	7,150
Miscellaneous Barton	8,215	7,620
Russell County	24,500	23,650
Sedgwick County	3,950	3,825
Ellis:		
Bemis	7,275	6,375
Miscellaneous	4,133	2,690
Kingman County	695	660
Stafford County	7,325	4,730
Greenwood County	8,900	8,875
Butler County	19,500	19,450
Other fields	18,812	17,165
Total Kansas	169,950	153,800

Rice County

Mid-Plains Oil Co. No. 2 Van Blarcom, C W half E half NW Section 10-21-7w, Wherry pool, Rice County, found conglomerate at 3,359-74 feet, total depth, flowed 250 bbls. of oil in eight hours and made daily potential of 750 bbls.

Gulf Oil Corp. No. 4 Stout, SE NE NE Section

(Continued on Page 280)



Midcontinent Map Co., Wichita

Rig was being erected at Power Oil Co. and Olson Oil Co. No. 1 Van Paten, Section 26-4s-21w, wildcat in Norton County, Kansas

Southwest Texas District

By F. L. SINGLETON

Extensions of Pools; Discover New Pays; More Trend Tests

CORPUS CHRISTI, Tex., Apr. 17.—Wildcat operations along the Jim Wells County sector of the active Frio-Vicksburg trend, continues to hold the attention of operators in Southwest Texas as a production test was being made on a prospective pool opener southwest of the Alfred field, while another test northwest of the town of Alice, cored sand with an oil showing and was attempting to make a drill-stem test. Other interesting developments included the opening of a new producing area southwest of the Benavides field, Duval County, and a mile south extension to the Mellon Creek field in Refugio County.

Ike Howeth No. 1 O. S. Adams, southwest of the Alfred field in the William Adams Survey, Jim Wells County, was running tubing preparatory to completing in the Frio sand at 4,661-74 feet, total depth, where the previous week the well tested 500 feet of 47-gravity oil and 93 pounds of working pressure on a 10-minute drill-stem test. While this well is only 1½ miles from the Alfred field, it is apparently on a separate structure in view of the fact that production in the latter field is from the Pettus sand at approximately 3,300 feet.

Northwest of Alice and in the La Tinaja de Lara grant, Texas Gulf Producing Co. No. 1 A. M. Garza, cored sand with an oil showing at 6,438-41 feet, and the section was being drill-stem tested. One mile southwest of Magnolia City, A.B.&M. Survey, F. A. Gillespie and others were plugging back to sidetrack No. 1 Mary T. Shear due to mechanical trouble which prevented a production test of a sand section at 5,440-50 feet. On the west side of the Alice townsite, H. H. Howell was drilling No. 1 T. H. McCampbell, in the LaVava grant, below 5,330 feet.

A new producing area, 1½ miles southwest of the Benavides field, Duval County, was opened with the completion of Henderson Coquat and others No. 1 Southland Life Insurance Co., which was completed in the Pettus sand at 5,286-98 feet, total depth, for an initial production of 170 bbls. of pipe line oil daily, flowing through a 5/32-inch choke. Tubing pressure was 600 pounds and casing pressure 1,240 pounds. The well is in Section 7, of the Ball Ranch subdivision, Agua Poquita grant, and although production may be eventually linked with the Benavides structure, the area has been named "Southland" by the nomenclature committee of the South Texas Geological Society.

Two Wildcat Failures

Two wildcats located along the Pettus trend of Duval County were marked up as dry holes. Arkansas Fuel Oil Co. and others No. 1 L. Parr, Pedro Saen Survey No. 12, was quit at a total depth of 5,812 feet. while south of the town of Realitos, Jose M. Ynojosa grant, Luling Oil & Gas Co. No. 1 Dimmitt was abandoned at 6,012 feet. In the southwest part of the county, and in the Diego Ynojosa grant, Texas Gulf Producing Co. No. 1 John Dunn, cored sand and shale with an oil odor at 4,118-24 feet, and a drill-stem test was being made at the end of the week.

In the Mellon Creek field, Refugio County, Quintana Petroleum Co. extended production 1 mile south with the completion of No. 3-B O'Connor which flowed an initial production of 650 bbls. through a quarter-inch choke. The well was drilled to a total depth of 5,895 feet, and production was obtained by perforating casing opposite oil sand at 5,863-69 feet. The same company is moving about a mile east for its second location, in the center of Unit No. 10, Quintana subdivision in the Timothy Hoyt Survey.

In the same county, and about 4,000 feet north of the Tomoconnor field, Winsor Oil Co. extended production with the completion of No. 1 J. E. Power. Casing was perforated with 12 holes at 5,935-38 feet, and the well was completed for an initial production of 150 bbls. of 34.4-gravity oil, flowing through an eighth-inch choke under a tubing pressure of 800 pounds and casing pressure 1,050 pounds.

Interest in the Riverside field, Nueces County, was revived to some extent by the showing of Seaboard Oil Co. No. 3 Ellen C. Wilson which showed for a producer on a drill-stem test. The hole is bottomed at 5,011 feet, and casing is being cemented for completion after a drill-stem test at 5,005-10 feet, tested 1,150 feet of pipe line oil and 90 pounds of working pressure in 10 minutes. The well is located in the Vincente Lopez Herrera grant, a south offset to Shell Oil Co. No. 1 Griffin, recently abandoned at 7,510 feet. Approximately 1½ miles north of the Luby field, Seaboard Oil Co is moving in material for No. 1 LaPrelle in the Roberts and White subdivision.

East White Point Extended

The producing area of the East White Point field, San Patricio County, was extended north and south as two new producers were added, and four other tests were in the process of completion. On the extreme northwest side of the field, R. A. Welch No. 1 fee flowed 109 bbls. daily through an eighth-inch choke from perforated casing at 5,658-58 feet, and at 5,678-82 feet. On the south side of the field in Section 49, Sinclair Prairie Oil Co. No. 2 Womack topped sand at 5,627 feet, and was running casing after coring to the total depth of 5,677 feet. Nueces Royalty Co. No. 1 Woodward, perforated casing at 5,620-24 feet, and was completed for an initial production of 138 bbls. daily through an eighth-inch choke. Other tests which had cored the sand, include Plymouth Oil Co. No. 1 Malone; Houston Oil Co. No. 3-A Baldwin; Nueces Royalty Co. No. 1 Roper, and Humble Oil & Refining Co. No. 1 Countiss. One mile north of the field, Paul Benedum and others No. 1 Phillips, Elbert G. Head Survey, is drilling below 5,300 feet, and should be coring for the 5,600-foot sand by the first of the week.

In the McCampbell Field

In the active McCampbell field, Aransas and San Patricio counties, four oil wells were completed and production tests were being made on four other wells. Abbott & Travler No. 1 Ruhman, center of Lot 1, Section 109, flowed 554 bbls. daily through a three-sixteenths inch choke; Landrum & Jones No. 1 Conn Brown, flowed 551 bbls. through a three-sixteenths inch choke; Tom Graham Oil Co. No. 3 Moeller was completed for an initial production of 538 bbls. daily through a three-sixteenths inch choke, while Walter Brauer No. 3 fee, flowed 543 bbls. daily through a three-sixteenths inch choke. All wells were completed in the 7,100-foot horizon. Paul Benedum No. 1 Bell, J. K. Culton No. 1 Barry Estate, and Corgey and Grote No. 1 Peterson-O'Brien had covered the 7,100-foot pay and were being completed.

Humble Oil & Refining Co. No. 1 Mestena Oil & Gas Co., east of the town of Randado, Jim Hogg County, has been abandoned at a total depth of 7,000 feet. This well logged several encouraging showings below 5,000 feet and additional development is expected to be started in the area.

One mile northwest of the Sun field, Starr County, Sun Oil Co. No. 1 Speer was completed through perforated casing at 4,966-72 feet, and flowed 208 bbls. of oil and 20 bbls. of water per day through a three-sixteenths inch choke under a tubing pressure of 800 pounds and casing pressure 1,475 pounds. The well is located in the northwest part of the C.C.S.D.&R.G.N.G. Survey No. 238.

SOUTHWEST TEXAS COMPLETIONS IN PROVEN FIELDS

Aransas-San Patricio Counties

McCampbell field: J. C. Abbott and others No. 1 Ruhman, perforated casing 7,123-27 feet, 88 bbls. 21 hours, 7/64-inch choke. Landrum and Jones No. 2 Dixon, perforated casing 7,123½-28½ feet, 112 bbls.; one-eighth inch choke.

Bee County

Tulsita field: Atlantic Refining Co. No. 1 Courtney, perforated casing 3,623-31½ feet, 18 bbls., pumping.

Caldwell County

Branyon field: Coffield and Robinson No. 10 Young, 2,223 feet, 384 bbls., pumping. Salt Flat field: Camp Oil Co. No. 1 J. D. Wright, 2,676 feet, 35 bbls. oil, 1,400 bbls. of water, pumping.

Duval County

Cedro Hill field: Magnolia Petroleum Co. No. 5 Duval County Ranch Co., 1,443 feet, 50 bbls., pumping. Texas Co. No. 25 Duval County Ranch Co., 1,459 feet, 115 bbls., jetting. Hoffman field: Continental Oil Co. No. 7 Collings, perforated casing 2,686-91 feet, 160 bbls., one-quarter inch choke. Magnolia Petroleum Co. No. 30 Well, 2,828 feet, 145 bbls., jetting. Magnolia Petroleum Co. No. 31 Well, sand 2,820-28 feet. 125 bbls., jetting. Longhorn field: M. M. Miller & Sons No. 4 fee, perforated casing 4,055-65 feet, 108 bbls.. 5/32-inch choke. Piedra De Lumbre, sand 2,007-20 feet, 175 bbls., pumping.

Guadalupe County

Darst Creek field: Diamond Half Oil Corp No. 1 Forshage, 2,531 feet, 105 bbls. oil, 20 bbls. water, pumping. Hartman Drilling Co. No. 1 Roamel, 2,639 feet, abandoned. Lincoln Petroleum Co. No. 1 Appling, 2,601 feet, 98 bbls. oil, 13 bbls. water, pumping.

Hidalgo County

Samfordyce field: Brinkoeter Oil Corp. No. 3 Guerra, sand 2,839-57 feet, 83 bbls., pumping.

Jim Hogg-Brooks Counties

Kelsey field: Humble Oil & Refining Co. No. 5 McGill Brothers, perforated casing 6,103-08 feet, 65 bbls., 9/64-inch choke.

Live Oak County

Oakville field: Rosebrock Brothers No. 1 Rosebrock, 2,805 feet, abandoned.

McMullen County

Ezzell field: Harry Ezzell No. 35 fee, perforated casing 1,452-58 feet, 95 bbls., pumping. E. M. Jones No. 63 Ezzell, sand 1,534-41 feet, 39 bbls., pumping. E. M. Jones No. 65 Ezzell, perforated casing 1,513-19 feet, 47 bbls., pumping. E. M. Jones No. 67 Ezzell, perforated casing 1,498-1,503 feet, 36 bbls., pumping. E. M. Jones No. 72 Ezzell, perforated casing 1,531-35 feet, 41 bbls., pumping. E. M. Jones No. 74 Ezzell, perforated casing 1,527-33 feet, 44 bbls., pumping.

Nueces County

Agua Dulce field: Union Producing Co. No. 1-A Kinsely, perforated casing 4,845-61 feet, 15,000,000 cu. ft. of gas. Luby field: Sun Oil Co. No. 8 McCann, perforated casing 5,054-60 feet, 118 bbls., one-eighth inch choke. South Clara Driscoll field: Wellington Oil Co. No. 1 Richardson, perforated casing 6,558-66 feet, 147 bbls., one-quarter inch choke. Richard King field: Southern Minerals Corp. No. 16 King, perforated casing 6,136½-40 feet, 38 bbls. of oil, 325 bbls. of water, one-quarter inch choke. Riverside field: Shell Petroleum Corp. No. 1 Griffin, 7,510 feet, abandoned. Saxet field: Richardson Petroleum Co. No. 8 Perkins-LaGasse, perforated casing 6,519-25 feet, 118 bbls., one-quarter

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inch choke. Sinclair Prairie Oil Co. No. 1 Isensee, perforated casing 4,727-40 feet, 108 bbls., one-eighth inch choke. West Saxet field: Renwar Oil Corp. No. 3-C Kenedy, perforated casing 4,039-42 feet, 180 bbls., 5/32-inch choke.

Refugio County

La Rosa field: Coronado Corp. No. 2 Michna perforated casing 6,336-39 feet, 139 bbls., one-eighth inch choke. Hewitt and Dougherty No. 4 Rooke, perforated casing 6,338½-42½ feet, 155 bbls., 10 per cent salt water, one-eighth inch choke. Refugio field: Houston Oil Co. No. 62 Rooke, perforated casing 6,212-17 feet, 189 bbls., one-eighth inch choke. Tomoconnor field: Quintana Petroleum Co. No. 8 Heard, perforated casing 5,875-83 feet, 617 bbls., one-quarter inch choke. Quintana Petroleum Co. No. 39-C O'Connor, perforated casing 5,868-76 feet, 1,300 bbls., three-eighths inch choke. Quintana Petroleum Co. No. 8 Williams, perforated casing 5,906-14 feet, 650 bbls., one-quarter inch choke. Windsor Oil Co. No. 1 Power Heirs, perforated casing 5,935-38 feet, 150 bbls., one-eighth inch choke.

San Patricio County

East White Point field: Houston Oil Co. No. 2-A Baldwin, perforated casing 5,623-28 feet, 227 bbls., 5/32-inch choke. Humble Oil & Refining Co. No. 4 Speer, 5,680 feet, 141 bbls., 7/64-inch choke. Plymouth Oil Co. No. 1-B Bailey, perforated casing 5,631-59 feet, 115 bbls., 7/64-inch choke. Sinclair Prairie Oil Co. No. 1 Womack, perforated casing 5,648-58 feet, 154 bbls., one-eighth inch choke.

Victoria County

McFaddin field: Barnsdall Oil Co. No. 23 McFaddin Estate, 4,060 feet, abandoned. Barnsdall Oil Co. No. 24 McFaddin Estate, sand 4,407-12 feet, 186 bbls., three-sixteenths inch choke.

Kansas Fields

(Continued from Page 277)

6-18-10w, in the Habiger-Stumps-Bloomer area, had Arbuckle lime at 3,217-19 feet, total depth, pumped 579 bbls. of oil in eight hours and made 24-hour potential of 1,739 bbls.

Shell Oil Co., Inc., No. 1-A Wiggins, C E half NE Section 11-20-8w, Lyons gas field, had dolomite at 3,290-97 feet, total depth, gauged 20,000,000 cu. ft. of gas daily and was completed.

New operations in Rice County: Shell Oil Co. No. 15 Zajic, NE SE NE Section 13-18-8w, cellar; Barnsdall Oil Co. No. 1 Murphy, SE SW SW Section 22-19-9w, rigging up rotary; Gulf Oil Corp. No. 1 Charles, SE SE SW Section 28-19-9w, set casing and waiting on cement at 221 feet; Mid-Plains Oil Co. No. 1 Deweese, C E half W half NW Section 10-21-7w, building rotary rig.

Russell County

Cities Service Oil Co. No. 2-B Krug, NW NW SW Section 13-15-14w, Trapp field, Russell County, had Lansing-Kansas City lime series at 3,104-3,226 feet, total depth, pumped 424 bbls. of oil in eight hours and made daily potential of 1,272 bbls.

J. A. Aylward & Gulf Oil Corp. No. 3 Holl, SE SW SW Section 22-14-14w, Allon area, was treated with acid, pumped 259 bbls. of oil in eight hours and had daily potential rating of 778 bbls. It was completed in Lansing lime at 2,970-3,030 feet, total depth.

Cities Service Oil Co. No. 1 Resner, NE NE SW Section 23-15-14w, was a location.

Ellis County

Cities Service Oil Co. No. 11-B Hall, NE NE NW Section 26-11-17w, Bemis field, Ellis County, was completed for 24-hour potential of 3,500 bbls. of oil in Arbuckle lime at 3,546-48 feet, total depth.

Courtney B. Davis No. 1 Jensen, SW SE SW Section 12-12-18w, was drilling below 1,420 feet.

Cowley County

W. M. McKnab No. 1 Moon, SW SW SE Section 16-32-5, Frog Hollow pool, Cowley County, topped Bartlesville sand at 3,045 feet, was bottomed at 3,073 feet, pumped and flowed 152 bbls. of oil in eight hours and was completed for daily potential of 456 bbls.

Meade Brothers No. 1 Julian, NE SE SW Section 16-33-3e, Rainbow Bend field, pumped 125 bbls. of oil and 25 bbls. of water in 24 hours from Bartlesville sand at 3,207-39 feet, total depth, and was completed.

B. B. Blair No. 3 Dunlop, SE NW NE Section 21-32-5, was a location.

Ellsworth County

Spencer & Yarnell No. 3-B Patzner, SW NW SW Section 31-17-10w, Ellsworth County sector of the Bloomer field, found Lansing lime at 2,930-3,049 feet, total depth, and flowed at the rate of 40 bbls. an hour. After acidizing with 6,000 gallons, it made potential of 6,560 bbls. of oil by bottom-hole bomb and then made potential of 7,140 bbls. by depthograph.

Butler County

Rex & Morris No. 1 Sutter, SE SE NE Section 7-28-7, Butler County, found Bartlesville sand at 2,618-54 feet, total depth, and had initial yield of 70 bbls. of oil in 24 hours.

Same operators' No. 2 Hutton, NE SW SW Section 14-28-7, Brandt pool, found Mississippi lime at 2,675-2,704 feet, total depth, was acidized and pumped 40 bbls. of oil in 24 hours.

Adair & Morton No. 1 Dunne, SW cor. Section 23-26-7, Young area, topped Mississippi lime at 2,739 feet and was dry and abandoned at 2,775 feet, total depth.

Same operators' No. 2 Ramp, NW NW SW Section 14-28-7, was a cellar. Rex & Morris No. 1 Allen, NW SW SW Section 21-26-7, was a location. Both are in Butler County.

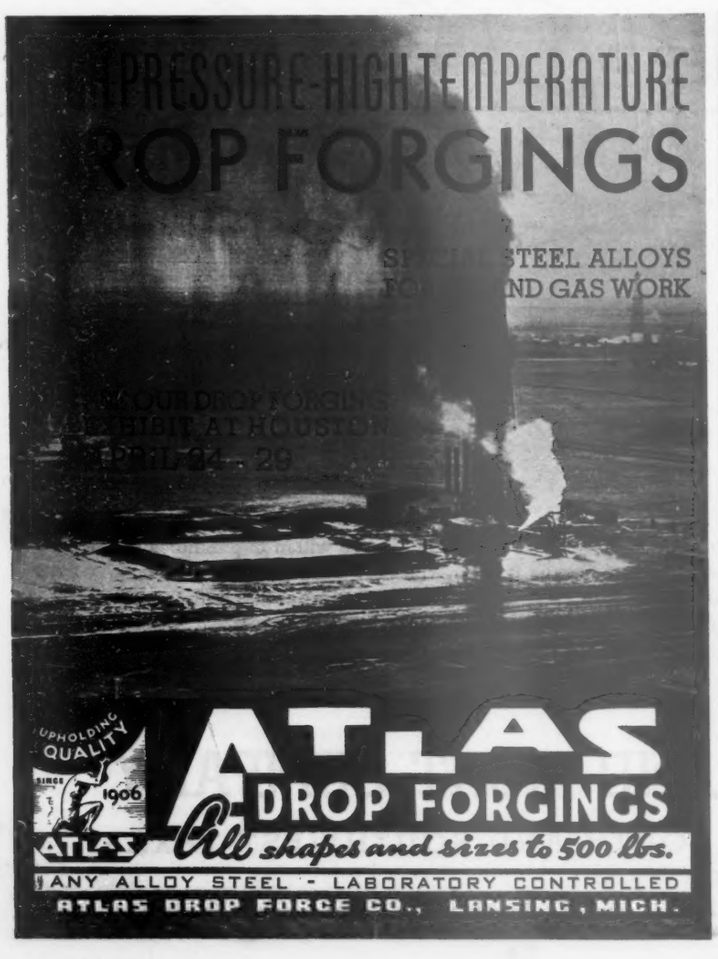
In McPherson County, Westgate-Greenland Oil Co. No. 1 Eason, SW SE NW Section 18-17-1w, was a cellar.

In Sumner County, Champlin Refining Co. No. 7 Lane, SW NW SW Section 9-30-2w, was a location.

Missouri Operations

ST. JOSEPH, Mo., Apr. 17.—Location for a third wildcat to be drilled in Holt County, northwestern Missouri, was announced the past week. It was the Brin & Nathan No. 1 Garrett, NW NW SE Section 28-60-35w, about 5 miles southeast of the J. H. Everitt and others No. 1 Spring, SW SW SE Section 30-62-

(Continued on Page 287)



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Texas and Louisiana Gulf

By NEIL WILLIAMS

Prospective Pool in Brazoria; Find New Turtle Bay Sands

HOUSTON, Tex., Apr. 17.—The testing of a prospective pool opener in the Juliff area, Brazoria County; important extensions and new sand discoveries in the Turtle Bay field, Chambers County, and at the Thompson field in Fort Bend County, provided the Texas sector of the Gulf Coast district with an interesting week of developments.

Two miles north of the Sandy Point field, and south of the town of Juliff, Brazoria County, Hamman Exploration Co. was preparing to perforate casing for a production test of No. 1 Darrington State Prison Farm in the A. McFarland Survey. The well has been drilled with much secrecy and just where the first test will be made is not known. The hole is bottomed at an estimated depth of 8,894 feet, and 7-inch casing was cemented on bottom. The well is reported to have logged favorable showings in both the Frio and Vicksburg formations, but details as to where the sands were cored were not released by the company.

A new pool or a 1-mile east extension to the Turtle Bay field, Chambers County, was apparently opened by the showing in Stanolind Oil & Gas Co. No. 1 Mrs. Tassie Lotz, G. B. Jamison Survey, which is running screen and liner for a production test after the well flowed pipe line oil on an 18-minute drill-stem test. This well was given little chance of producing last week after a drill-stem test in the Frio formation at 6,642-47 feet, tested 59 thribbles of salt water. The latest test was made in the Marginulina sand through perforated casing at 6,547-52 feet, and the well flowed 32-gravity oil for 25 minutes after the testing tool was closed. Seventy feet of brackish water, recovered after the drill stem was pulled from the hole, is believed to have been from the original test.

A revival of drilling on the north flank of the Thompson field, Fort Bend County, is anticipated following the completion of H. N. Naylor and others No. 1 O. F. Musselman which opened prolific production from a deeper sand, generally believed to be the Vicksburg formation. The hole is bottomed in sand at 7,800 feet, and the well was completed after the crew had set three joints of screen from 7,703 feet, that being the bottom of the 7-inch casing. During the first three hours of a 24-hour potential test, the well flowed at the rate of 45 bbls. of 35.7-gravity oil per hour through a quarter-inch choke under an equalized tubing and casing pressure of 1,800 pounds. The well is located in the Horatio Chrisman Survey, about 1,800 feet north of the field which heretofore has produced from both the Miocene and Oligocene (Marginulina) formations at approximately 3,100 and 5,300 feet. The thick section of sand indicates production may extend over a wide area and the territory between the well and the Sugarland field, several miles to the north is expected to be explored. The Musselman well is the second deep hole drilled on the north flank and additional wells can be expected on other parts of the structure.

On the northwest flank of the Eureka field, Harris County, and offsetting Jack Frazier No. 1 Lackner, an 8,000-foot producer, Houston Oil Co. No. 2-D Lackner, was completed through perforated casing at 7,707-15 feet for an initial production of 623 bbls. per day, flowing through a quarter-inch choke under a tubing pressure of 750 pounds and casing pressure of 900 pounds. This well was drilled to the 8,000-foot sand, but found only a slight showing of oil in it. It is the first producer in that area completed in the 7,700-foot sand.

In the Algoa area, Brazoria County, Crosby Drilling Co. made a third production test at No. 1 Wilson, A. G. Reynolds Survey, and the well tested salt water through perforated casing at 8,870-80 feet. This is the third time the well has been tested as two previous attempts at 9,493-97 feet and at 9,463-69 feet, showed the same results.

New Wells in League City

Two producers were completed in the League City field, Galveston County. On the southwest side of the field and offsetting George Echols No. 2 Ross-Stewart, Salt Dome Oil Corp. and others No. 2 Ross-Stewart is cleaning out through perforated casing at 8,690-95 feet, flowing 7 bbls. per hour through an eighth-inch choke under a tubing pressure of 1,100 pounds and casing pressure 1,300 pounds. Offsetting the discovery well to the north, Phillips Petroleum Co. No. 1 J. C. Ott flowed 237 bbls. per day on an eighth-inch choke from perforations in the 9,200-foot sand.

In the Lynchburg area, Harris County, Housh & Thompson are rigging up No. 1 Hine, a 6,500-foot Frio test located in the Arthur McCormick Survey. In Orange County, C. B. Bunte, Inc., and others staked location for a wildcat, No. 1 Miller Vidor Lumber Co. in the John M. Swisher Survey.

In the Francitas field, Jackson County, and southeast of the discovery well, Crosby Drilling Co. was preparing to make a production test of a new sand in No. 1 Kopnicky. Seven-inch casing was cemented on bottom at 7,967 feet, and the casing will be perforated opposite sand at 7,949-60 feet. The discovery well, No. 1 Broughton, was completed in sand at 7,389-98 feet. Northeast of Texas Co. No. 1 Weed, a distillate producer, Mills Bennett Production Co. No. 1 R. A. Lowrance is drilling below 8,075 feet after a drill-stem test at 7,949-60 feet, tested salt water and a small amount of working pressure.

South Louisiana

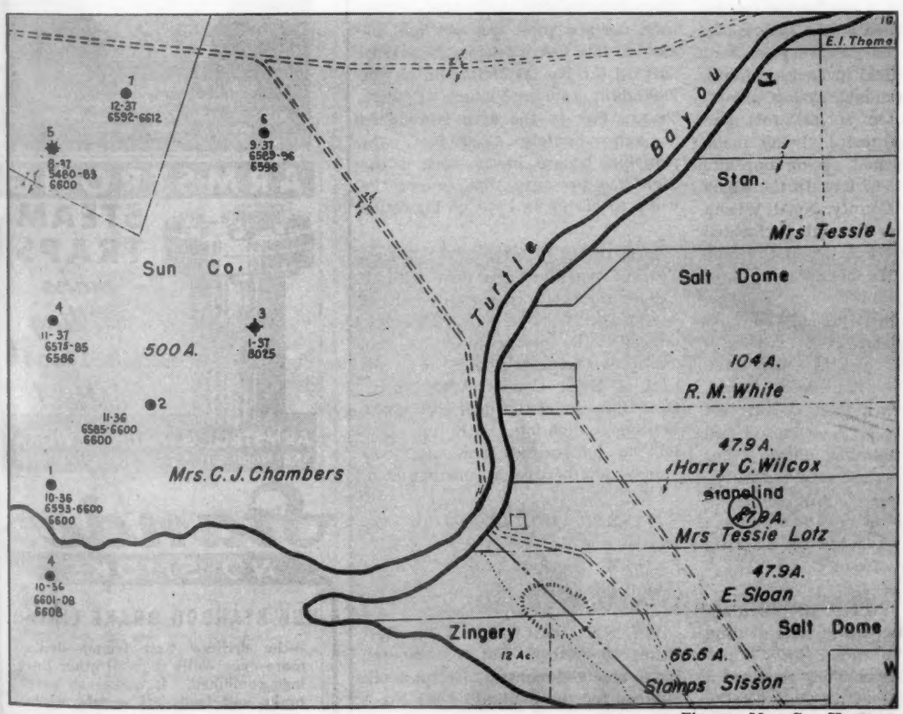
The completion of an outpost well 2,000 feet northeast of production in the Eola field, Avoyelles Parish, and the opening of a new sand in the Golden Meadows field, La Fourche Parish, were the highlights of development in coastal Louisiana the past week.

Pomo Production Co. No. 1 Sentell extended production of the Eola field, Avoyelles Parish, as the well showed for an excellent producer while cleaning out from perforated casing opposite oil sand, cored at 8,500-70 feet. The hole is bottomed at 8,578 feet and 7-inch casing was cemented at the total depth. Interest in the field is now centered on J. E. Jones No. 1 Haas Investment Co., 3,000 feet southeast of production. The well topped the Cockfield sand at 6,497 feet, and the Cook Mountain formation at 6,993 feet. Based on these markers the well is running lower than the discovery well. At the end of the week the hole was below 7,720 feet and the Sparta sand overlying the Wilcox (Tertiary) is reported to have been saturated.

In Rapides Parish, Gulf States Exploration Co. has derrick up for No. 1 Jack Cappell in Section 37-4n-4w. This is the second wildcat drilled by the company in this parish since the opening of the Eola field. To the west, and about 2½ miles south of the town of Cravens, Vernon Parish, Humble Oil & Refining Co. made tentative location for a wildcat in Section 32-1s-6w.

One mile northeast of the discovery well in the Golden Meadows field, La Fourche Parish, Martex Petroleum Co. No. 1 Falgout Holding Co., Section 9-19s-22e, recovered 36 stands of 42-gravity oil on a 15-minute drill-stem test at 7,171-7,202 feet, and the hole is being carried deeper in search of the discovery horizon, found by Texas Co. No. 1 LaTerre, the discovery well at 8,500-20 feet. This is the second sand cored as a previous showing which was not drill-stem tested, was cored in

(Continued on Page 295)



Zingery Map Co., Houston

Part of the Turtle Bay field, Chambers County, showing location of Stanolind Oil & Gas Co. No. 1 Tessie Lotz, which has opened a new producing area east of the field

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Among the Drilling

HOUSH & THOMPSON extended production of the Tomoconnor field, Refugio County, Texas, approximately 4,000 feet with the completion of Windsor Oil Co. No. 1 J. E. Power. Casing was perforated at 5,935-38 feet, and the well flowed 150 bbls. daily through an eighth-inch choke. In the Lynchburg area, Harris County, No. 1 Hine, a wildcat in the Arthur McCormick Survey, is being rigged up. The well is being drilled for themselves and will be carried to a depth of 6,500 feet. On the Smith's Point area, Chambers County, No. 1 Robbins, a projected 9,500-foot test, is being spudded.

LOFFLAND BROTHERS opened prolific production from the Vicksburg sand on the north flank of the Thompson field, Fort Bend County, Texas, for H. M. Naylor and others. The well was drilled on the Musselman lease and was completed at a total depth of 7,800 feet for an initial production of 926 bbls. daily, flowing through a quarter-inch choke under a tubing and casing pressure of 1,800 pounds. The rig will be moved north for a second test within the next few weeks.

CROSBY DRILLING CO. is preparing to make a production test of a new sand logged in No. 1 Kopnicky southeast of the discovery well of the Francitas field in Jackson County, Texas. Seven-inch casing was cemented on bottom at 7,967 feet, and the production test is being made through perforated casing opposite oil sand at 7,918-67 feet. In the Algoa area, Brazoria County, No. 1 Wilson tested salt water through perforated casing at 8,870-80 feet, and the hole is expected to be abandoned.

ALLEN & MORRIS are running casing in Seaboard Oil Co. No. 3 Wilson, located in the Luby field, Nueces County, Southwest Texas, after a drill stem test at 5,005-10 feet tested 1,150 feet of pipe line oil and 90 pounds of pressure. Seven other active operations are reported in the Luby field, Nueces County, McCampbell field in Aransas and San Patricio counties and at the La Rosa field in Refugio County.

FALCON - SEABOARD Drilling Co. has two interesting tests drilling in La Fourche and Point Coupee parishes, Louisiana. They reported a depth of 6,000 feet on Gulf Oil Co. No. 1 Grandison, east of Golden Meadow in La Fourche Parish, Louisiana. The contract calls for a 12,000-foot hole and is probably the deepest test ever contracted. Operators set 2,200 feet of 13⅜-inch surface pipe and if necessary will run a protective string of 9⅝-inch at 8,500 feet or below with a pay string of 7-inch being run in case production is obtained. Wells drilled in the area have had to overcome two obstacles, a hot salt water flow which breaks down the walls of the hole and heaving shale. A large steam rig with four 350-pound working pressure boilers, 14 by 14 drilling engine and a six-speed hoist with 9-inch shafts is being used on the test. The Gulf block totals about 22,000 acres. On the No. 1 Hobgood in the Pike's Peak block of Falcon-Seaboard and others, a depth of 3,000 feet was reached last week. The test is in Section 8-1s-7e, Point Coupee Parish, Louisiana, and is scheduled for a total depth of 8,000 feet with tests being made in the Cockfield, Sparta and Wilcox sands. Falcon-Seaboard owns approximately 3,500 acres while the associates own approximately 2,500 acres of the block which originally belonged to Harry Hanson, Perry Scranton and Hogg Brothers of Houston, Tex. Deep Rock Oil Co., Arkansas Fuel & Gas Co. and the Barnsdall Oil Co. are interested in the test. The company reports that 1,479 feet of 9⅝-inch surface pipe was set and cemented late last week on the Barnsdall Oil Co. No. 26 McFaddin on the McFaddin ranch, Victoria County, Texas. Pay in the area is reached at approximately 4,500 feet; the principal hazard in the area is the high gas pressure that causes the wells to crater in case of blowouts.

LEE DRILLING CO., Fort Worth, Tex., is negotiating a deal with J. Lee Johnson, for the south half of Section 5, Block 42, T.&P. Survey, one-half mile to the north of production on the east side of the Foster pool of Ector County, West Texas. It is understood the deal calls for a drilling obligation, with the first test to be started soon after the transaction has been consummated.

HARBER DRILLING CO. has started a well at No. 1 Waite, NE W half SW Section 21-31-4e, Cowley County, Kansas.

WYNNE DRILLING CO., East Texas operators and contractors, have received contract from J. K. Hughes for the drilling of his No. 1 Hyman Pearlstone, scheduled Woodbine test nearly a mile north of the operator's No. 1 Bane, oil discovery

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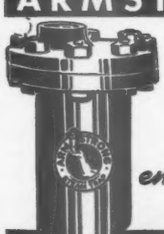

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ARROW DRILLING CO., Odessa, Tex., is completing its No. 9 Foster, in Section 8, Block 42, T.&P. Survey, three fourths of a mile east of the main production in the Foster pool of Ector County, West Texas. The well was shut in at 4,285 feet, in lime, after encountering several pay sections from 4,130 feet to 4,214 feet.

O. F. WRIGHT, drilling contractor of Tulsa, has started work at Delfeld and others No. 1 E. T. Turner, NW NW Section 27-59-9w, wildcat in Shelby County, northeastern Missouri.

HELMERICH & PAYNE, INC., Tulsa, is putting down a well for the Tide Water Associated Oil Co. This is No. 1 Cowlings, in SW cor. SE of Section 18-2s-13w, in the Mount Carmel area of Wabash County, southeastern Illinois.

S. A. GERMANY, scout for Shell Oil Co. in the East Texas district, has returned to his territory after having a minor operation.

OLSON DRILLING CO., Tulsa, and Power Oil Co. are building a rig at No. 1 Van Patten, NE NE NE Section 26-4-21w, Norton County, Kansas.

NOBLE DRILLING CO., Tulsa, drilling for Pure Oil Co. at No. 1 Noble, C NE SE Section 35-5s-1, Carter County, Oklahoma, has gone to 6,902 feet in sand and shale. A core was taken at 6,902-10 feet. A drill-stem test got a gas show at total depth of 6,867 feet and packer was set at 6,844 feet. In 45 minutes the wildcat blew gas and 90 feet of mud, with no oil. Crews were drilling in quartzitic sand in the Bergen zone.

H. & M. DRILLING CO. completed No. 1 LaGree, NW NW Section 31-19-1w, McPherson County, Kansas, at total depth 2,967 feet (corrected) in chat; potential 626 bbls. of oil.

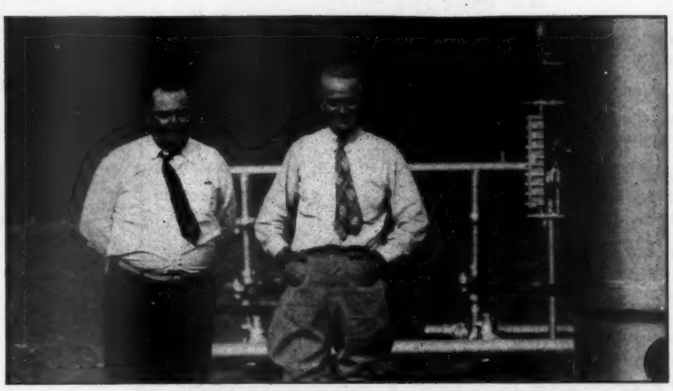
SPRING ROSE DRILLING CO. No. 1 Pillman, 3 or 4 miles northwest of Birk City, Ky., swabbed 75 bbls. of oil and some water in five hours after acidization at total depth of 1,977 feet in the McClosky. Additional tankage is being installed.

VIERSON DRILLING CO. will drill No. 2 Kimble, SE NE Section 10-14-10, Creek County, Oklahoma.

DUWE & FARRIS, Wichita, at No. 1 Weins, Section 6-19-9, Rice County, Kansas, are setting casing to test a show in the Arbuckle at 3,240 feet. They set pipe at No. 1 Weins in Arbuckle lime at 3,234-40 feet, total depth.

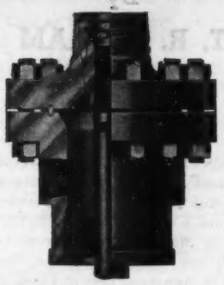
CAMPBELL DRILLING CO. and others will drill No. 1 Killingsworth, NW NE SW Section 14-9-6, Creek County, Oklahoma.

LANORA DRILLING CO. has staked location for the No. 1 Goodrich, in NE SW SE of Section 14-5-5e, in the Wetley area of Seminole County, Oklahoma.



Bill Crippen, tool pusher for Loffland Brothers, and H. M. Naylor, independent operator, on location in the Thompson field, Fort Bend County, Texas, where last week prolific production from a new sand was opened by the completion of Naylor No. 1 Musselman, a 7,800-foot producer

BAASH-ROSS TUBING HEADS



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T. R. INGRAM

Loco Hills Productive Area Extended One Mile to North

DENVER, Colo., Apr. 17.—Completions in the northern Rocky Mountains area were limited to three in the Cut Bank field, Montana, of which two were dry holes, and one, a small producer, in the Kevin-Sunburst field, also in Montana. New operations totaled seven, of which one was in Colorado, three in Wyoming, and three in Montana. One of these is an important wildcat in Sublette County, Wyoming, which may go to 10,000 feet, and will be drilled by the California Co. The Texas Co. and California Co. also released a location for their second well on Wilson Creek in Colorado, which will test the Morrison sand a little more than a mile to the northwest of the discovery well. A dry hole in North Cut Bank in the Yukon Oil Co. No. 2 Lungren indicates that pool is separate from the Cut Bank field. The Continental Oil Co. No. 1 Delahoyde, northeast of Lance Creek, had water in the Sundance and will drill to the Minnelusa sand.

NEW MEXICO

The Loco Hills pool in Eddy County, southeastern New Mexico, was extended 1 mile northward at Allen, Fair & Pope No. 1 Snowden and others, SE NE SE Section 36-17-29. It was reported to have flowed 100 bbls. of oil in 24 hours through casing from sand at 2,740-60 feet, total depth 2,775 feet, and was shut in. Operators were preparing to shoot.

Operators were preparing to set casing at Harvey E. Yates No. 1 Travis, NE SE SE Section 6-18-29, Eddy County pool opener about 5 miles west of the Loco Hills area. It flowed 40 bbls. of oil in 14 hours after shooting at 2,490-2,580 feet.

Two completions were reported in the Vacuum area, Lea County, and there were six completions elsewhere in Lea County. The completed wells were:

Humble Oil & Refining Co. No. 2-K State, C NW NE Section 32-17-35, Vacuum field, topped pay at 4,360 feet, total depth 4,675 feet, pumped 37 bbls. of oil in eight hours and pumped off.

Standard Oil Co. of Texas No. 2 State, Lease 6, C NE SW Section 34-17-35, found pay at 4,375 feet, was drilled to 4,649 feet, total depth, and plugged back to 4,602 feet. In a six-hour test it flowed 27 bbls. of oil an hour through choke on tubing set at 4,594 feet.

In the Eunice field, Gulf Oil Corp. No. 1-C Leonard, C SE SW Section 36-21-36, flowed 597 bbls. of oil in 24 hours through open tubing set at 3,814 feet, Gas gauged 700,000 cu. ft. daily. Pay was topped at 3,710 feet, total depth 3,820 feet.

Aloco Oil Co. No. 1 Carson, C SW SE Section 28-21-37, Hardy area, topped pay at 3,680 feet, was shot and flowed 126 bbls. of oil in six hours, with very little gas. Total depth was 3,765 feet.

Skelly Oil Co. No. 5 Sims, C NW SE Section 33-22-37, Penrose district, flowed 148 bbls. of oil in 24 hours through tubing set at 3,700 feet. Pay was found at 3,562-3,656 feet, total depth 3,705 feet.

In the Mattix area, Humble Oil & Refining Co. No. 4 Williams, C NW NW Section 34-24-37, flowed 224 bbls. of 40-gravity oil in eight hours from pay topped at 3,412 feet, total depth 3,530 feet.

Richmond Drilling Co. No. 2-A State, C SW SW Section 2-25-37, Langlie field, had pay at 3,401 feet, was bottomed at 3,414 feet, and flowed 80 bbls. of oil in four hours.

Phillips Petroleum Co. and Pure Oil Co. No. 2 Woolworth, C SE NE Section 6-25-37, found pay at 3,420 feet, total depth 3,525 feet, and flowed 187 bbls. of oil in six hours through tubing set at 3,483 feet. Gas gauged 745,000 cu. ft. daily.

Lea County

Fred Turner, Jr., No. 1 Lea County State Bank, C SW SW Sec. 30-14-38 (wildcat). Drlg. 4,803 ft.
Carper-Taylor No. 1 Taylor (wildcat), SW SW SW Sec. 30-16-32. T.D. 4,045 ft.; 200 ft. O.I.H.
Magnolia Pet. Co. No. 1-Q State, C SW NE Sec. 36-16-36. Drlg. 1,625 ft.
Repollo Oil Co. No. 2 State, Lse. 182, C S½ NE SW Sec. 31-16-37. Drlg. 3,335 ft.
Carper Drlg. No. 1 Simon, C NE NE Sec. 29-17-32. Drlg. 1,950 ft.
Cities Service No. 2-K State, C SE NE Sec. 27-17-35. Drlg. 3,080 ft.
Continental Oil Co. No. 1-A Sanderson B-14, C N½ NW NW Sec. 14-20-36. W.O.C. 1,443 ft.
Continental Oil Co. No. 6 State H-35, C NE NW Sec. 35-17-34. W.O.C. 294 ft.
Drlg. & Exploration No. 1-M State, C SW SE Sec. 29-17-35. Drlg. 3,012 ft.
Drlg. & Exploration No. 1-W State, NW NW SE Sec. 26-17-35. Drlg. 2,940 ft.
Humble O. & R. Co. No. 5-K State, C SE NE Sec. 32-17-35. C.&P.
Humble O. & R. Co. No. 4-K State, C NE SE Sec. 32-17-35. Drlg. 4,526 ft.
Magnolia Pet. Co. No. 2-P State, C SE SE Sec. 22-17-35. W.O.C. 4,290 ft.
Magnolia Pet. Co. No. 1-R State, C NW SE Sec. 1-17-36. Drk.
Magnolia Pet. Co. No. 1 Selby, C NW NE Sec. 7-17-37. Drlg. 1,810 ft.
Magnolia Pet. Co. No. 27 State-Bridges, C SE NE Sec. 26-17-34. Drlg. 4,718 ft.
Magnolia Pet. Co. No. 28 State-Bridges, C NW NW Sec. 26-17-34. T.D. 4,281 ft.; drlg. plug.
Magnolia Pet. Co. No. 29 State-Bridges, C SW SW Sec. 26-17-34. Drlg. 4,605 ft.
Magnolia Pet. Co. No. 30 State-Bridges, C SW NE Sec. 26-17-34. Drlg. 3,690 ft.
Magnolia Pet. Co. No. 31 State-Bridges, C NE NW Sec. 23-17-34. C.&P.
Maljamar O. & G. Co. No. 2-B Baish, C NE NE Sec. 27-17-32. T.D. 2,602 ft.; S.D.O.
Maljamar O. & G. Co. No. 2 Mitchell, SW SE SW Sec. 5-17-32. Drlg. 1,610 ft.
Ohio Oil Co. No. 1 State-Warn, C SE NE Sec. 33-17-35. Drlg. 4,175 ft.
Phillips Pet. Co. No. 4 Hale, C SE SW Sec. 35-17-34. Loc.
Phillips Pet. Co. No. 5 Hale, C NW SE Sec. 35-17-34. R.U.R.
Phillips Pet. Co. No. 12 Santa Fe, C NE SW Sec. 28-17-35. T.D. 4,700 ft.; prep. to pmp.
Phillips Pet. Co. No. 15 Santa Fe, C NE NE Sec. 28-17-35. T.D. 4,700 ft.; B. 3 gal. O.P.H.; S.D.O.
Phillips Pet. Co. No. 27 Santa Fe, C SW NE Sec. 34-17-35. Drlg. 4,030 ft.
Phillips Pet. Co. No. 29 Santa Fe, C SW NW Sec. 33-17-35. Drlg. 127 ft.
Shell Oil Co. No. 1-T State, C NE SE Sec. 33-17-35. R.U.R.
Shell Oil Co. No. 1-V State, C NE NE SE Sec. 21-17-35. Rng. tbg. 4,680 ft.
Shell Oil Co. No. 2-N State, C SE NE Sec. 28-17-35. T.D. 1,515 ft.; fsg. junk.
Texas Co. No. 3-N State, C SW NW Sec. 30-17-35. Drlg. 2,770 ft.
Texas Co. No. 2-S State, C SW SW Sec. 35-17-34. W.O.C. 4,230 ft.
Texas Co. No. 1-T State, C SE NE Sec. 25-17-34. T.D. 4,725 ft.; pump 5 B.O. and pump off; to C.O.
Texas Co. No. 2-T State, C SW SE Sec. 34-17-34. Drlg. 4,055 ft.
Twin Oil Corp. No. 1-D State, C SW NE Sec. 30-17-35. T.D. 4,700 ft.; P. off 5 B.O. in 11 hrs.; S.D.O.
United Producers No. 1 Caylor, NE NE NW Sec. 6-17-37. Spd.
Fullerton Oil Co. No. 1-A Walker, C SW NW Sec. 18-18-32. T.D. 4,225 ft.; S.D.O.
Phillips Pet. Co. No. 16 Santa Fe, C NW SW Sec. 5-18-35. T.D. 5,030 ft.; P.B. 4,300 ft.; to perf. csg.
Texas Co. No. 1-X State, C NE NE Sec. 3-18-34. T.D. 4,250 ft.; to run Schlumberger.
P. B. English No. 1 Miller, C NE SE Sec. 18-19-32 (wildcat). T.D. 3,077 ft.; W.O. csg.
Great Western Prod. Co. No. 2 Bordages, NE SE NW Sec. 33-19-37. T.D. 3,931 ft.; P. 115 B.O.P.D. (last report).
Continental Oil Co. No. 5 Britt B-15, SL NW NE SW Sec. 15-20-37. Drlg. 3,657 ft.
Stanolind O. & G. Co. No. 4-B Gilluby, NW NW NW Sec. 22-20-37. Drlg. 1,820 ft.
Texas Co. No. 17 Lieu-Lands, NW NW SW Sec. 19-20-37. T.D. 3,850 ft.; F. 21 B.O. in 24 hrs.
Bryant-Drillexco No. 3 State, C S½ NW SE Sec. 12-21-35. T.D. 3,725 ft.; S.G.
Danglade & Clower No. 1 Corrigan, C NE SE Sec. 33-21-37. T.D. 3,615 ft.; W.O.C.
Danglade & Clower No. 1 Owen, NW SW SW Sec. 34-21-37. T.D. 3,755 ft.; F. 50 B.O.P.D.; acd.
Drlg. & Exploration Co. No. 1-D Shell, C SW SE Sec. 36-21-36. Loc.
Gulf Oil Corp. No. 1-C Carson, C NE NE Sec. 33-21-37. Drlg. 3,152 ft.
Gulf Oil Corp. No. 2-B Mattern, C SE NE Sec. 31-21-37. T.D. 3,800 ft.; shot and swb. 22 B.O. in 9 hrs.
John G. Menke No. 2 Alexander, C NE NW Sec. 5-21-37. T.D. 3,788 ft.; shot; rec. H.F.O.
J. C. Clower No. 1 Christmas, SE SE SW Sec. 28-22-37. Drlg. 230 ft.
Continental Oil Co. No. 6 State J-2, C SW SE Sec. 2-22-36. W.O.C. 1,440 ft.
Continental Oil Co. No. 5 State J-2, C SE SE Sec. 2-22-36. Drlg. 3,415 ft.
Gulf Oil Corp. No. 4-E Mattern, C SW SW Sec. 1-22-36. R.U.R.
Olean Pet. Co. No. 2 Farrell, SW SE SE Sec. 22-22-37. T.D. 3,757 ft.; P.B. 3,655 ft.; S.D.
Lem Peters No. 2 Call, C W half NW SW Sec. 26-22-37. Drlg.
Repollo Oil Co. No. 1-D State, Lse. 157, NW NW SW Sec. 12-22-36. Drlg. 1,720 ft.
Shell Pet. Corp. No. 1 T. O. May, NW NW NW Sec. 35-22-37. W.O.C. 1,187 ft.
Skelly Oil Co. No. 2-A Baker, SW SW NW Sec. 26-22-37. Drlg.
Skelly Oil Co. No. 7 Baker, C NW NE Sec. 27-22-37. T.D. 3,655 ft.; C.O. 3,550 ft.
Skelly Oil Co. No. 8 Baker, SW NE NE Sec. 27-22-37. C.&P.
Texas Co. No. 2-B Fally, C SE SW Sec. 8-22-37. T.D. 3,720 ft.; P.B. 3,702 ft.; F. 27 B.F. in 11 hrs.
Texas Pacific C. & O. No. 15-A State, C N½ SE NW Sec. 11-22-36. Drlg. 3,508 ft.
Continental Oil Co. No. 1 Lynn A-28, C SW NE Sec. 28-23-36. Drlg. 820 ft.
Walter Donnelly No. 1 Davis, C SE NW Sec. 33-23-37. T.D. 3,600 ft.; tstg.
Great Western Prod. No. 2-B Leonard, C NW NW Sec. 32-23-37. T.D. 3,496 ft.; W.O.C.
Anderson & Prichard No. 1-A State, C SW NW Sec. 32-24-37. Drlg. 150 ft.
Humble O. & R. No. 1-L State, C NE SE Sec. 32-24-37. Drlg. 3,061 ft.
Kan-Mex Oil Co. No. 3 Vaughn, C SW NW Sec. 3-24-36. Drlg. 2,692 ft.
North Shore Oil Corp. No. 3 Woolworth, SW SW NW Sec. 33-24-37. T.D. 3,554 ft.; fsg. tools; S.O.&G.
North Shore Oil Corp. No. 4 Woolworth, NW NW NW Sec. 33-24-37. Loc.
Parker Drlg. Co. No. 3 Erwin, C W½ NE SW Sec. 35-24-37. T.D. 3,460 ft.; F. 10 B.O. in 8 hrs.; est. 3,000,000 cu. ft. gas.
Phillips and Pure No. 5 Woolworth, C SW SE Sec. 33-24-37. T.D. 3,539 ft.; F. 29 B.O. in 11 hrs.
Phillips and Pure No. 7 Woolworth, C SW NE Sec. 33-24-37. Loc.
Repollo Oil Co. No. 2-C State Lse. 157, NE SE SE Sec. 32-24-37. Drlg. 2,927 ft.
Schermerhorn Oil Co. No. 5 Woolworth, NW SW NE Sec. 28-24-37. T.D. 3,546 ft.; F. est. 200 B.O.P.D.
Schermerhorn Oil Co. No. 6 Woolworth, C SW SE Sec. 28-24-37. Drlg. 3,231 ft.
Shasta Oil Co. No. 1 Woolworth, NE NE NW Sec. 28-24-37. T.D. 3,601 ft.; tstg.
Weir Drlg. Co. No. 3 Woolworth, NE SW SW Sec. 28-24-37. Drlg. 3,462 ft.
Anderson & Prichard No. 5 Wells, C NW NE Sec. 5-25-37. T.D. 3,552 ft.; to acd.
Anderson & Prichard No. 6 Wells, C SW NW Sec. 5-25-37. Loc.
Anderson & Prichard No. 7 Wells, C NW SW Sec. 4-25-37. Loc.
Anderson & Prichard No. 1 Woolworth, NW NE NE Sec. 17-25-37. T.D. 3,454 ft.; F. 15 B.O.P.D.
Cities Service No. 2 Dabbs, SW SW NW Sec. 23-25-37. C.&P.
Italo Pet. Corp. No. 1 Carlson, SW NE NW Sec. 26-25-37. Drlg. 3,000 ft.
Italo Pet. Corp. No. 3 Carlson B-27, NE SE SE Sec. 27-25-37. M. on grd.
Richmond Drlg. No. 3-A State, C SE SW Sec. 2-25-37. R.U. mch.
Sam Weiner No. 3 Smith, CN½ NE SE Sec. 4-25-37. T.D. 3,506 ft.; C.O. to 3,500 ft.; F. 2 B.F.P.H.
Stanolind O. & G. No. 1-B Gregory, C SW NW Sec. 15-26-37. Loc.

Eddy County

Allen, Fair & Pope No. 1 Snowden, SE NE SE Sec. 36-17-29. T.D. 2,775 ft.; pay 2,740-60 ft.; S.D.O.
Allen, Fair & Pope No. 2 Snowden, SE SW SW Sec. 36-17-29. Loc.
B. L. Arnold No. 1 Arnold, NW NW NW Sec. 34-17-30. Drlg. 1,210 ft.
Aston & Fair, Inc., No. 1 Hudson, C NE NE Sec. 18-17-31. Drlg. 3,175 ft.
W. H. Berry No. 1 Berry, NE NE NE Sec. 24-17-27. S.D. rprs. 548 ft.; bail est. 2 B.O.P.D.
Hammond & Sons No. 1 Ployhar-State, SW SW SE Sec. 16-17-28. T.D. 1,971 ft.; P.B. 1,825 ft.; S.I.
J. O. and J. H. Hammond No. 1 Paris, NE NW NW Sec. 5-17-29. S.D.O. 25 ft.
Flint Prod. Co. No. 1-L Dexter, SE NW SE Sec. 15-17-30. Drlg. 3,905 ft.
Grayberg Oil Co. No. 12 Burch, NW NW SE Sec. 19-17-30. Drlg. 670 ft.
Ohio Oil Co. No. 4 State-McCallister, Sec. 25-17-34. W.O.C. 510 ft.
Plains Prod. No. 1 Daugherty (wildcat), SE SE SE Sec. 11-17-27. S.D.O. 240 ft.
C. S. Powell No. 1 Smith, NW NW NE Sec. 6-17-29. T.D. 2,845 ft.; P.B. 2,500 ft. and S.D.
Repollo Oil Co. No. 5-A Parke, NW NE NW Sec. 22-17-30. T.D. 2,931 ft.; drlg. plug.
Repollo Oil Co. No. 4-A Keel, SE NE SW Sec. 7-17-31. Drlg. 3,101 ft.; S.O. 3,036-45 ft.
Repollo Oil Co. No. 3 West, NE NE NE Sec. 3-17-31. Drlg. 2,280 ft.
W. K. Royalty No. 3-B State, C NE NW Sec. 16-17-31. Loc.
J. H. Steinberger No. 2 Hastie, SW SW SW Sec. 18-17-28. R.U.R.
Welch & Welch No. 1 State, NE NE SE Sec. 20-17-28. T.D. 1,970 ft.; S.D. rprs.
Adkinson Oil Co. No. 1 Brainard, SE SW SE Sec. 5-18-27. S.D. reprs. 1,650 ft.
Barney Cockburn No. 1 State-Graham, C NE NE Sec. 16-18-31. Drk.
Etz & Cone No. 1 Nelson, SE SE NE Sec. 10-18-30. S.D. rprs. 390 ft.

Farmer & Tallmadge No. 1 Hubbell, NE SW Sec. 4-18-25. T.D. 400 ft.; skid 15 ft. NW.
Franklin Pet. Corp. No. 1 Canfield, NW NW NW Sec. 7-18-30. M.I.M.
Franklin Pet. Corp. No. 1 Cappedge NW SW NW Sec. 5-18-30. Drlg. 1,120 ft.
Green Bay Oil No. 1-A Johnson, C SE SE Sec. 11-18-31. T.D. 3,775 ft.; P. 102 B.O. in 78 hrs.
Harvey E. Yates No. 1 Travis, NE SE SE Sec. 6-18-29. T.D. 2,606 ft.; rng. csg.
C. L. Jones No. 1 Brainard, NW SW NW Sec. 1-18-27. Drlg.
H. W. Martin No. 1 Gates, SE SE SW Sec. 15-18-30. Loc.
Plains Prod. No. 1 Swearingen, C NW NE Sec. 14-18-31. R.U. mch.
Martin Yates No. 1 Saunders, NE NE NE Sec. 12-18-29. Drlg. 1,705 ft.
Carper Drlg. Co. No. 1 Quillen, C NW NE Sec. 12-19-31. S.D.O. 2,765 ft.
Geo. E. Robb No. 1 Vandagriff, SW NE Sec. 6-19-31. T.D. 800 ft.; S.D.O.
Rhodes Drlg. No. 2 Swearingen, C NE NE Sec. 14-18-31. Loc.
Texwell Corp. No. 1 Sullivan, C SE SW Sec. 23-18-31. Loc.
R. C. Underwood No. 1 Quillen-Bruce, NE NE SE Sec. 4-19-31. T.D. 3,655 ft.; fsg. bit.
Martin Yates, Jr., No. 1 Bowers, SW SE SE Sec. 31-19-27. T.D. 1,180 ft.; est. 25-40 B.O.P.D.; tstg.
Trojan Oil Co. No. 1 Grant, SW SW NE Sec. 33-20s-25e. Drlg. 508 ft.
C. F. Ingram No. 1 Page, NE NE SW Sec. 15-21-28. T.D. 2,978 ft.; S.D.O.
Barnett Oil Dev. Co. No. 1 King, C NW SE Sec. 23-26-30. Drlg. 3,745 ft.

Chaves County

Mac T. Anderson No. 1 Warnock, C SW SE Sec. 17-15-27. T.D. 780 ft.; U.R.
Comanche Drlg. No. 1 Campbell, NE NE NW Sec. 15-11-26. Drlg. 185 ft.
Nay Hightower No. 1 Billingslea, C SW NE Sec. 28-11-30. T.D. 3,290 ft.; S.D.
New, Russell & Wood No. 1 Sterrett (wildcat), NW SE NW Sec. 29-11-25. Drlg. 530 ft.
Tarkenton Bros. No. 1 Peters, SE SE NW Sec. 33-11-25. S.D. 399 ft.
Western Minerals, Inc., No. 1 Dow (wildcat), C SW NW Sec. 27-10-30. C.&P.

De Baca County

N. E. Woods No. 1 Jones, C NE SW Sec. 17-4n-20. T.D. 620 ft.; S.D. rprs.
James D. Ward No. 1 Summers, SE NE SW Sec. 15-4n-24e. T.D. 680 ft.; S.D.O.

Luna County

O. D. Berry No. 1 Berry, SE SE SW Sec. 33-22s-10w. Drlg. 300 ft.

Roosevelt County

Shell Oil Co. No. 1 Harwood, C S½ SE SE Sec. 27-7s-35e. Drlg. 7,819 ft. L.

NORTHWEST NEW MEXICO

San Miguel County

Ben E. Keith No. 1 McCune, SW SE SW Sec. 32-16n-12e. T.D. 10 ft.; ran 1 jnt. 10-in.
Southwest Drlg. Co. No. 1 Conchas, NW NE Sec. 34-17n-21e. Drlg. 1,600 ft.

San Juan County

Al Greer No. 2 fee, SW SE SW Sec. 10-30n-11w. Drlg. 900 ft.
Continental Oil Co. No. 89 Rattlesnake, SE NE NE Sec. 2-29n-19w. Spdg.

Valencia County

C. A. Grober et al No. 1 Fuqua, NE NE Sec. 19-5n-3e. Cg. below 1,450 ft.
Joiner Oil Corp. No. 1 San Clement, C NE SE Sec. 23-7n-1e. T.D. 5,606 ft.; trying to loosen frozen D.P.

COLORADO

Boulder County

Reynolds & Rohr No. 1 Thomas, SW SW Sec. 17-1n-70w. Drlg. 1,958 ft. in sdy. sh.; S.O.&G.

Fremont County

Waterville Oil Co. No. 1 Persons, CWL NE NE Sec. 17-18s-69w. U.R. for W.S.O. at 65 ft.
Isadore Spangler No. 1 St. Marys, SE SE SE Sec. 2-19s-70w. T.D. 2,040 ft.; C.O.

La Plata County

Nick Spatter No. 1-X Bryce, SE SW SW Sec. 31-33n-9w. T.D. 2,352 ft.; fsg. for 8¼-in. parted at 630 ft.

Moffat County

MacKinnie Oil & Drlg. Co. No. 1 Coles, SW SW SE Sec. 1-3n-92w. T.D. 3,230 ft.; apparently on top red sh. marker; U.R. 6¼-in. 25 ft. off bttm.

Park County

South Park Oil Co. No. 1 Leman, NE NE SE Sec. 34-11s-75w. Drlg. 6,905 ft.

Pueblo County

Eden Oil & Gas Co. No. 1 Horse Creek Land & Cattle, SW SE Sec. 29-19s-64w. Landed 5⅞-in. on bttm. at 2,060 ft.; drlg. ahead.

Rio Blanco County

The Texas Co. released location for its No. 2 Unit, NW SE SW Section 27-3n-94w, joint operation with the California Co. on the Wilson Creek structure and contractor is building road and preparing to move in rotary equipment. Contract was let to the Noble Drilling Co. and the well will go to the Morrison sand at around 6,700 feet. Location is a little more than a mile northwest of No. 1 Unit, the discovery well, completed in January, 1938, in the Morrison for 492 bbls. first 24 hours through the 2½-inch tubing, after plugging back from the Sundance at a total depth of 6,918 feet. Following the bringing in of the discovery, considerable geological work has been done and apparently the new location is intended to feel out the productive limits of the Morrison on the west side. The discovery was opened up last July for a prolonged production test and produced 60,149 bbls. in the six months ending with December, the total in December being 19,691 bbls., a daily average of 635. At present it is running around 310 bbls. per day. The oil is being trucked to Craig. Right of way was purchased last year for roadway and may be used for pipe line to Craig when sufficient production is developed. According to a Petroleum Information, Inc., map the new well is approximately on the same structural contour as the discovery and west of the apex. The oil averages 46 gravity A.P.I. scale and has a paraffin base.

The Buford Oil Co. No. 1 Government, on the Buford structure, 16 miles southeast of the Wilson Creek dome, which has been shut down for the winter at 3,645 feet, is moving in casing to resume. This is an important test of Pennsylvanian and Mississippian beds. The structure is one of a series of domes, and the highest structurally, on the Danforth Hills uplift, which uplift also includes the Wilson Creek dome.

Texas Co.-California Co. No. 2 Unit, NW SE SW Sec. 27-3n-94w. Bldg. road.
Buford Oil Co. No. 1 Govt., C SW SW Sec. 16-1n-91w. T.D. 3,645 ft.; M.I. 6¼-in. to res.

WYOMING

Big Horn County

Yale Pet. Corp. No. 2 Yates, Lot 57 (NW SW) Sec. 34-56n-97w. Drlg. 2,582 ft.
Mule Creek Oil Co. No. 1 Sessions, Lot 53 (NW NW) Sec. 34-56n-97w. Drlg. 2,383 ft.
Libby-Keoughan No. 1 Sheets, SE NE SE Sec. 9-55n-96w. T.D. 3,440 ft.; C.O. 200 ft. off bttm.
A. L. Rankin No. 1 Karjala-Rankin, C SW NW Sec. 10-54n-94w. Drlg. 660 ft. (last report).

Carbon County

Sinclair-Wyo. Oil Co. No. 2-A Mahoney Unit, C SW NE Sec. 34-26n-88w. T.D. 4,326 ft.; fsg. D.P.
Producers Oil Co. No. 1 Lake Valley, CNL Sec. 14-20n-88w. Drlg. 1,940 ft.

Converse County

Wyshawn Oil Co. No. 1 Lindley, CNL SE SE Sec. 34-32n-69w. T.D. 2,865 ft. in Bell (base Minnelusa formation) sd.; prep. to P.B. to 1,053 ft. and test S.G. in Sundance.
Wyshawn Oil Co. No. 2 Lindley, C SW SW Sec. 35-32n-69w. Drlg. 2,525 ft.

DEEP-WELL WOVEN

Now made more flexible through an exclusive curing process that retains pliability in the high heat resisting synthetic resin saturants without sacrificing any of the many outstanding qualities for which GATKE Deep-Well Woven has long been noted.

In 445 Moulded Brake Block GATKE presents the crowning achievement of 25 years' persistent effort to advance operating efficiency. This revolutionary Brake Block stands head and shoulders above any other friction material ever tested in GATKE Laboratories.

In more than a year's service on the toughest applications GATKE 445 Moulded has demonstrated incomparable performance. The holding power of a giant at all service temperatures. Smooth, positive pick-up under all conditions. Smooth feed-off. Reduced temperatures through dissipation of heat. Long wear beyond belief. Complete freedom from any tendency to score.

Whatever your requirements write for information about the GATKE Product designed to do the job better with reduced maintenance cost.

25th Gatke Anniversary 1914—1939

BRAKE BLOCKS AND FRICTIONS

GATKE CORPORATION 228 N. La Salle St., CHICAGO, ILL.

Crook County

The Vickers Petroleum Co., of Wichita, Kans., is preparing to drill a test on the Government Canon structure, west central part of Crook County, according to John M. Little, general superintendent, who was in Casper to make final arrangements. The company has a block of 10,000 acres in the south half of Township 54n, Range 67w. Location has not yet been made. It will be a cable tool test through the Minnelusa series at around 2,500 feet.

Fremont County

Consolidated Oil Properties No. 3 Ewart, C SW SE Sec. 16-1n-1w. T.D. 1,245 ft.; rng. 8⅝-in. to test S.O. before D.D.
Frank Pouppirt No. 2 Fidelity Tr., NW NW SW Sec. 27-3n-1w. S.D. 1,200 ft.

Natrona County

General Pet. Corp. No. 1 Govt., C NW SE Sec. 21-35n-77w. Drlg. below 8,020 ft.

Niobrara County

The Continental Oil Co. No. 1 Delahoyde, an old well on the Ant Hills dome, 12 miles northeast of Lance Creek, drilling deeper from 4,118 feet, had water in the Sundance, topped at 4,731 feet, and is drilling ahead in the red beds with the sands in the Minnelusa as the next objectives. It had the top of the Morrison at 4,395 feet. The well was completed in the Dakota in 1928 as a discovery and since then except for a month's test, has been shut in. In April, 1928, it made 954 bbls.

One new operation in Lane Creek is getting under way in the Continental Oil Co. No. 8-B Schuricht, SW NW SE Section 6-35n-65w, an east offset to the Minnelusa Oil Co. No. 2 Joss, now drilling for the Leo sand.

There were no completions in Lance Creek.

Continental Oil Co.-Buck Creek Oil Co. No. 8-B Schuricht, SW NW SE Sec. 6-35n-65w. P.B. (first report).
Ohio Oil Co. No. 12 Carrie Putnam, NW SW NW Sec. 4-35n-65w. Drlg. 3,442 ft.
J. E. Manning No. 1 Hewitt-Govt., NW SW SW Sec. 4-35n-65w. Prep to spd.
Minnelusa Oil Corp.-MacKinnie O. & D. Co. No. 5 Thompson, SE SE NW Sec. 7-35n-65w. Drlg. 2,521 ft.
Ohio Oil Co. No. 3 Agnes Rohiff, C SE NE Sec. 32-36n-65w. T.D. 5,238 ft.; top Leo sd. 5,152 ft.; cmtd. 4¾-in. 5,150 ft.; W.O.C.
Continental Oil Co. No. 3-B Dielman, SW SE NW Sec. 8-35n-65w. Drlg. sh. and shells 3,400 ft.
Continental Oil Co. No. 2 E. Rohiff, NW SE NW Sec. 32-36n-65w. Drlg. r.b. 4,273 ft.; top 4,185 ft.; Sundance dry.
Minnelusa Oil Corp. No. 2 Joss, SE NE SW Sec. 6-35n-65w. Drlg. 4,662 ft.; top Converse sd. 4,659 ft.
Minnelusa Oil Corp. No. 3 H. & M.-5, NW NE SE Sec. 7-35n-65w. Cg. 5,465 ft.
F. F. Hintze et al No. 1 Wright-Govt., C NW SE Sec. 30-36n-63w. T.D. 4,964 ft.; P.B. to 4,190 ft.; redrld. to 4,245 ft.; rng. pkr. to test Dakota.
Fall River Roy. & Prod. Co. No. 1 Govt., CSL SE SE Sec. 35-40n-61w. T.D. 1,000 ft.; fsg. bailer.
Continental Oil Co. No. 1 Delahoyde, CNL NE NE Sec. 25-37n-63w. Drlg. r.b. 4,825 ft.

Sublette County

Location was released for an important wildcat to be drilled on the Pinedale structure in central Sublette County in the California Co. No. 1 Unit 1, C SW NE Section 14-31n-109w. Contract was let to Manning & Martin, Inc., which is moving in materials. Well may go to 10,000 feet, if necessary. It will start in the Wasatch formation of Tertiary age. California Co. has approximately 70,000 acres blocked up, all of which is in a unit agreement. Location was made following extensive geological surveys including the shooting of the entire area. The well was spotted on the New Fork River, 15 miles south of the town of Pinedale. The La Barge oil field is 35 miles to the southwest. The contractor will use heavy-duty superheated steam rotary rig with 136-foot steel derrick. The equipment was used in drilling a test for the same company on the Nesson anticline in North Dakota, which went to 10,281 feet and established a new depth record for the Rocky Mountain area.

The Texas Co.-Frontier Petroleum Corp. deep test at Dry Piney is making hole in the Frontier at 6,875 feet. An inspection of the big sand in that formation to 6,765 feet showed it to consist of streaky sand and shale and very tight with a slight show of oil. Four feet of core recovered at the bottom showed coal and sand. Coal in the Frontier is not unusual as the mines at Kemmerer are producing coal from that formation. The Frontier is approximately 2,500 feet thick in that area. The 7-inch was cemented at 5,607 feet and it now has 1,200 feet of open hole.

The Wyoming Petroleum Corp. No. 1 Charles Budd, on South Piney Creek, is preparing to run a Schlumberger test to locate sand at approximately 1,694-95 feet which had a show of oil and gas. The 8¼-inch will then be run and the sand tested. This well had a blowout in upper gas sand last winter and blew wild for several weeks.

California Co. No. 1 Unit 1, C SW NE Sec. 14-31n-109w. M.I.M.
Wyoming Pet. Corp. No. 1 Budd, C NE NE Sec. 10-29n-113w. T.D. 1,695 ft.; prep. to run Schlumberger and then 8¼-in. and test S.O.&G.
Texas Co.-Frontier Pet. Co. 1 Govt. Unit, SE SE SW Sec. 1-28n-114w. Drlg. 6,875 ft.

Sweetwater County

Sinclair-Wyo. Oil Co. No. 83 Lost Soldier, NW NE NE Sec. 10-26n-90w. Drlg. 1,643 ft.
Salegna Oil Co. No. 1 Union Pacific, C SW SW Sec. 10-20n-104w. T.D. 5,230 ft.; prep. to set whipstock at 2,900 ft. and drill by.

Uinta County

Drusilla Connell No. 6 Govt., C NW NW Sec. 24-15n-118w. S.D. 180 ft.

Weston County

Union Trust Oil Co. No. 1 Hockett, NE NE Sec. 23-47n-64w. Drlg. below 60 ft.
Whedon et al No. 1, C SW NE Sec. 21-46n-64w. T.D. 3,953 ft.; swbg.
Root et al No. 1 Robey, CSL NW SW Sec. 19-45n-61w. Spdg.
John Brorphy No. 1 George, SW SE NW Sec. 26-48n-64w. Res. at 2,304 ft.
Lem Johnston No. 1, NW SW Sec. 24-44n-63w. Drlg. below 2,600 ft.
F. P. Diiger et al No. 1, CEL SE SE Sec. 25-46n-64w. Drlg. 150 ft.
Selby & Langford No. 2, NW SE NE Sec. 6-46n-63w. Drlg. below 460 ft.; showing for comml. well in sh.
Hunter & Satterlee No. 1, C NW NW Sec. 10-43n-63w. R.U. (first report).

MONTANA

Carbon County

R. R. Tarrant No. 3 Govt., C SW NW Sec. 4-6s-18e. Rdy. to spd.
Alex Beaton No. 1, CSL SE SE Sec. 23-6s-23e. Drlg. 1,596 ft.
Miracle Oil Co. No. 2 Govt., CWL NE SE Sec. 3-6s-23e. T.D. 2,381 ft.; C.O. 1,550 ft.; to run 5⅞-in.

Glacier County

Drilling operations in the Cut Bank field this year will be held down to the minimum requirements unless there is a change in conditions, and the total number of wells is expected to be less than 50, or approximately the same number as in 1938. The program as outlined at present calls for 11 wells for the Texas Co., eight for the Santa Rita Oil & Gas Co., and 18 for the Glacier Production Co. These are the three largest operators. The remainder will include 10 to 15 wells by individual leaseholders and smaller operators.

There were three completions, of which two were dry holes, and one new operation. The Yukon Oil Co. No. 2 Lungren, C NE NW Section 26-37n-5w, in North

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Cut Bank, a south offset to No. 1 Lungren, the discovery in the Moulton sand late in 1938, which made 85 bbls. per day at 2,566 feet, proved to be a disappointment, and was plugged and abandoned. This, with the Nadeau well three-fourths of a mile to the southeast, indicates that North Cut Bank is a separate pool and that the discovery may have been an edge well. No. 2 Lungren had the Moulton sand at 2,500-79 feet, with 150,000 cu. ft. of gas and a spray of oil at 2,572-79 feet. The Sunburst was at 2,632-55 feet. The 7-inch was set at 2,700 feet after going through 28 feet of dry Cut Bank sand. There was a show of oil at 2,708-30 feet followed by water which rose 2,265 feet. Total depth is 2,735 feet, elevation 3,873 feet.

Tarrant-Long No. 7 Miller, NE SW NE Section 24-34n-6w, was dry and abandoned at 2,908 feet. Upper Cut Bank was at 2,780-2,832 feet with a show of oil at 2,787 feet, and lower sand at 2,832-88 feet was dry.

William Hanlon No. 4 All.-128, SW SE NE Section 12-32n-6w, tested 60 bbls. of oil per day while cleaning out at 2,978 feet, total depth. It had the Cut Bank at 2,940-76 feet with the main pay at 2,962-76 feet. It was shot with 75 quarts at 2,962 feet, and with 230 quarts at 2,962-76 feet.

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Santa Rita O. & G. Co. No. 2 Govt., SW SW NE Sec. 7-32n-5w. Loc. (first report).
Santa Rita O. & G. Co. No. 4 Ritchie, C NW NW Sec. 5-33n-5w. Spdg. 285 ft.
Tarrant-Wiley No. 2 Connolly, C SW NE Sec. 31-34n-5w. R.O.G.
Tarrant-McLellan No. 2 McLellan, C SW SE Sec. 12-34n-6w. R.U.
Texas Co. No. 6 Unit 9, C SW NW Sec. 9-32n-5w. Cmtd. 10¾-in. 685 ft.; Colo. 655 ft.
Glacier Prod. Co. No. 1 Callison Unit, SE SE NW Sec. 27-34n-5w. Drlg. 1,125 ft.; Colo. 270 ft.; 10¾-in. 325 ft.
Glacier Prod. Co. No. 2 McDougal, C SW NW Sec. 31-34n-5w. Drlg. 1,455 ft.; Colo. 490 ft.; 10¾-in. 513 ft.
Glacier Prod. Co. No. 3 Miller, C NE NE Sec. 29-33n-5w. Drlg. 2,110 ft.
Tarrant-Wiley No. 3 Jones, SW NW SW Sec. 31-34n-5w. Drlg. 2,080 ft.

Petroleum County

Nelson Story-Hogan, Ltd., No. 1 Austed, SW NW SE Sec. 22-13n-28e. Drlg. 1,300 ft.; 10-in. at 1,275 ft.

Teton County

Zodiac Oil Co.-Gulf States Oil Co. No. 1 Kellogg, NE NW NE Sec. 33-28n-5w. Drlg. 2,725 ft.

Toole County

Kevin-Sunburst had one completion and two new operations. The Big West Oil Co. No. 10 Gunderson, CSL NE NW Section 19-35n-2w, is pumping 6 bbls. of oil and 20 bbls. of water per day from the contact at 1,608-10 feet after acidizing with 500 gallons.

The G. & A. Oil Co. No. 1 Alrick, CNL NW NE Section 26-35n-3w, on an 80-acre lease upon which two dry holes were completed in the past, has 300 feet of oil in the hole from sand at 1,661-68 feet, and will acidize with 500 gallons. Showing indicates a commercial well.

A. E. Crumley & Son No. 14 Fryberger, CSL NW SE Sec. 24-33n-3w. Spdg. (first report).
Coolidge & Coolidge No. 6 Shaw, NE cor. Sec. 35-36n-2w. Drlg. 860 ft. (first report).
Big West Oil Co. No. 8 Dalquist, SW NW NE Sec. 28-35n-3w. Drlg. 1,710 ft.; 6⅝-in. at 1,617 ft.
K. C. Morton No. 1 Govt., SW SW SE Sec. 1-35n-3w. T.D. 1,556 ft.; prep. to D.D.
G. & A. Oil Co. No. 14 Goeddertz, NE SE SW Sec. 23-35n-3w. Drlg. 1,020 ft.
Superior Pet. Co. No. 11 Govt., CEL NW SW Sec. 12-35n-3w. T.D. 1,784 ft.; no results in L.; P.B. to comp. in Sunburst.
Kippen O. & G. Co. No. 1 Thompson, C NE SE Sec. 28-34n-1e. Drlg. 1,770 ft.; contact 1,746 ft.; S.O.; would not take acid; D.D.

UTAH

Cane Creek Oil Co. No. 1 Govt., NW SW Sec. 31-26n-21e. Drlg. blk. stky. sh. 3,170 ft.; S.G. through H. F.W.

Missouri Operations

(Continued from Page 280)

38w. The No. 1 Spring, first test to be started in Northwest Missouri since the Forest City basin lease boom began last summer, was temporarily shut down at 2,150 feet due to mechanical trouble. The third Holt County test, Markham and others No. 1 Gaffney, SW SW SE SW Section 24-63-40w, was a rig.

Work was due to start soon at Birkett, Gillespie & Bradley Brothers No. 1 Gee, NW NW SE Section 28-60-35w, location for a wildcat about 2½ miles north of Savannah, Andrew County. Davis Brothers of Independence, Kans., have the contract to drill this well, to be a deep test with Arbuckle lime expected around 2,600-2,700 feet. The area was checked by Everett Bradley, geologist of Wichita, Kans., and also by geologists of two major oil companies said to be contributing to the test. Birkett, Gillespie & Bradley Brothers have made location for a test in SE NW Section 22-58-23w, about 5 miles northeast of Chillicothe in Livingston County, and were expected to announce a test in Daviess County as soon as exact location can be determined.

Farrar & Hopp No. 1 Gard, NW NW Section 21-46-28w, in Johnson County, southeast of Kansas City, set casing at 355 feet, topped Mississippi lime at 460 feet and was drilling ahead.

It was announced the past week that money paid for stock in the Northern Missouri Oil Development Co., a project organized some time ago to finance two tests to be drilled in northern Missouri by H. V. Elwell, Wichita operator, was being returned to investors, insufficient subscriptions having been obtained. The Elwell test in Section 12-62-21w, Sullivan County, is still a rig.

Charles Delfeld and others No. 1 Turner, NW NW Section 27-59-9w, Shelby County, northeastern Missouri, cased off quicksands and was drilling below 190 feet.

Two tests were reported in southeastern Missouri. A. M. Sims No. 1 well, NW NW NW Section 3-37-21w, northeast of Hermitage in Hickory County, was drilling below 1,556 feet in Granite Wash. Martie Oil Co No. 1 Orr, SW SW SW Section 11-36-25w, about 10 miles south of Osceola in St. Clair County, was reported temporarily shut down at 170 feet.

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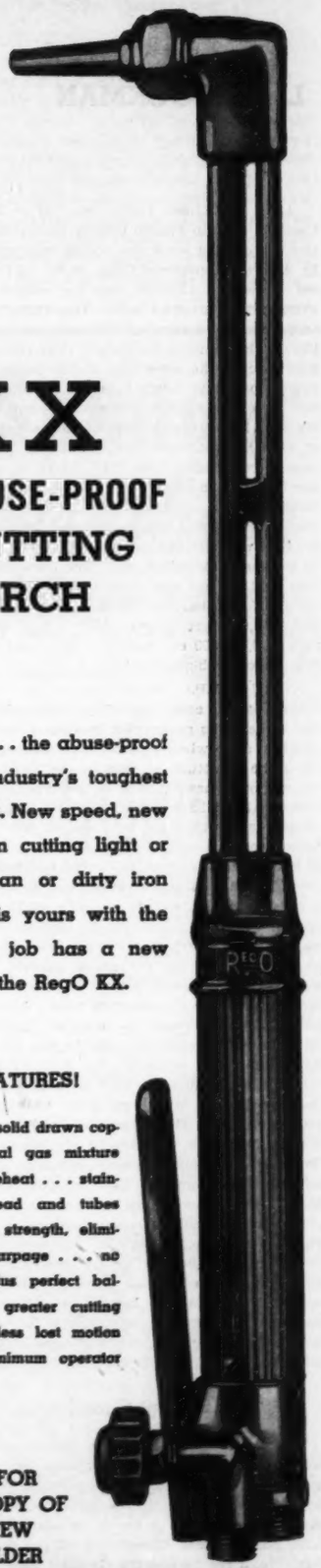

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